

THE MAGAZINE OF BETTER SCHOOL ADMINISTRATION

THE Nation's Schools

FEBRUARY

**Why We Chose
the Cluster Plan**

**Partners
in Maintenance**

**Our Daughter
Is an Ambassador**

**School Boards Need
Legal Counsel**

**Smoking Areas
for Teen-Agers**

Forty-six pages on

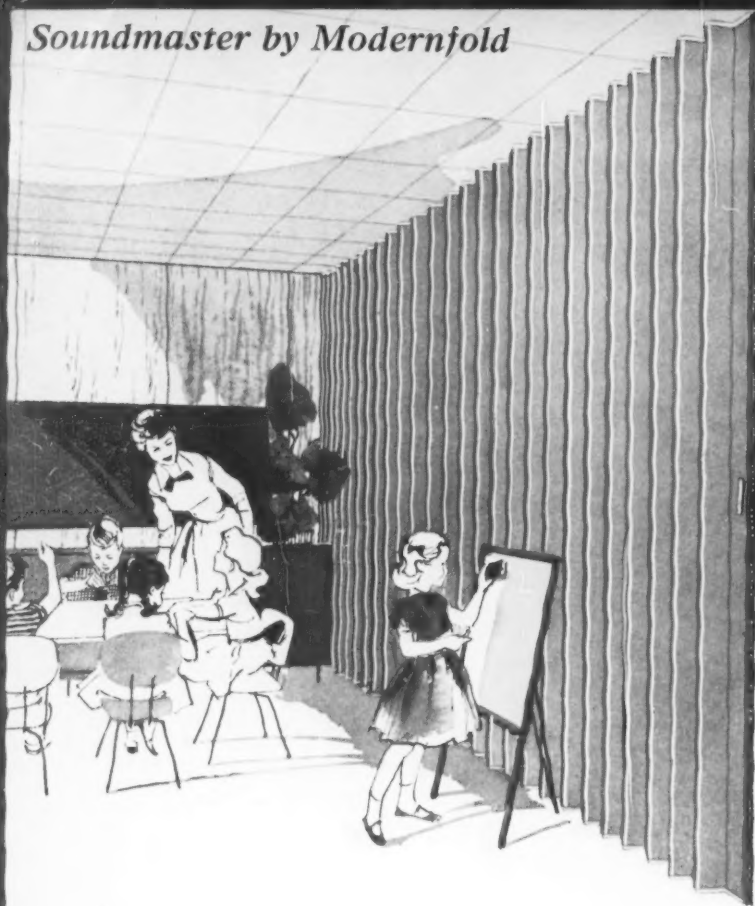
SCIENCE EDUCATION

*including three surveys,
thirty-six illustrations*

TABLE OF CONTENTS ON PAGE 3



Soundmaster by Modernfold



Nobody ever says Shhh with this Modernfold on the job

● Now . . . the Soundmaster adds effective sound control to Modernfold's traditional space control. And you reap the greatest flexibility ever in wringing maximum utility from a floor plan.

Get the specifics now. Find out how efficiently a Soundmaster folding partition can blot down sound on any job you do.

See your Modernfold Man . . . he's listed in the Yellow Pages, under "Doors, Folding." Or, write for: Soundmaster Facts and Specifications; NEW CASTLE PRODUCTS, INC.; NEW CASTLE, INDIANA. (In Canada: New Castle Products Canada, Ltd., St. Lambert, Que.)

Here's why:

You get an *all-around* sound barrier with a Soundmaster. Sound-smothering chipboard (Fig. 1) lines *both* interior sides. Sealer strips (Fig. 2) guard top and bottom. And the baffle-design jamb (Fig. 3) has a foam rubber liner that guarantees a leak-tight installation.

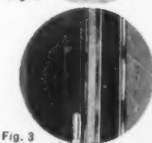
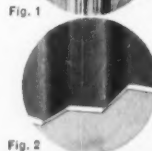
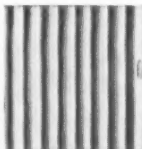


Fig. 3

Folding partitions for every need . . . every budget

From standard to giant-sized . . . from thrifty to luxurious . . . Modernfold has *the* door, divider or partition that answers your specific requirements. Choose from up to 60 vinyl fabric coverings in the steel framework models . . . or from the selection of rich wood finishes.

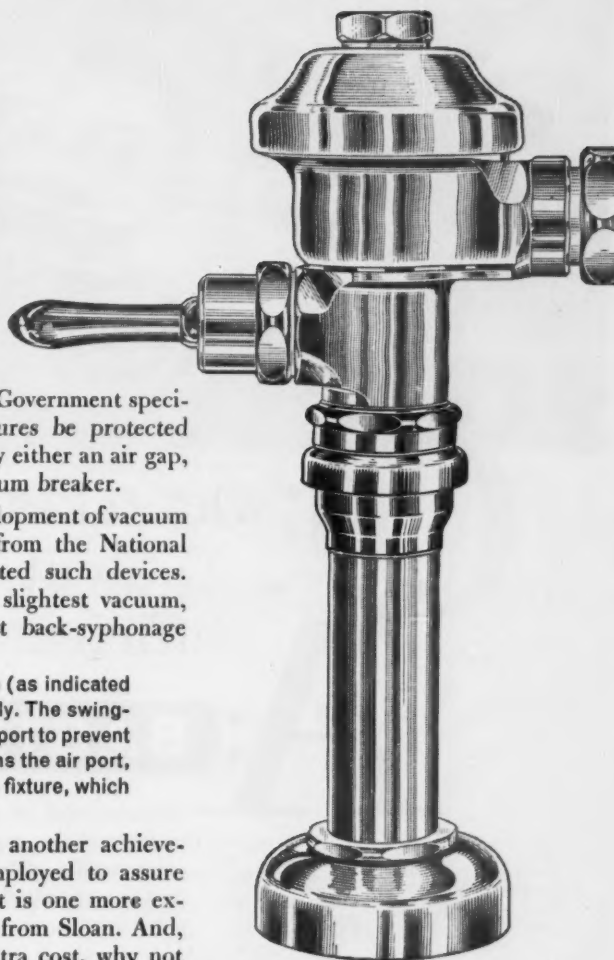
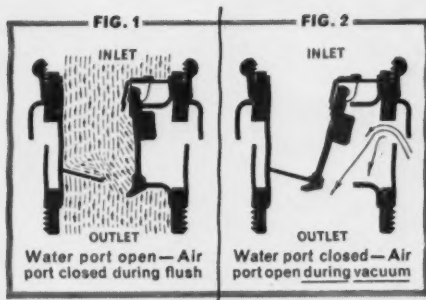


modernfold

®

You pay no more for unequalled SLOAN quality...

Double PROTECTION with SLOAN Vacuum Breakers



Municipal plumbing codes as well as U. S. Government specifications stipulate that all plumbing fixtures be protected against the possibility of back-syphonage by either an air gap, where practicable, or by an approved vacuum breaker.

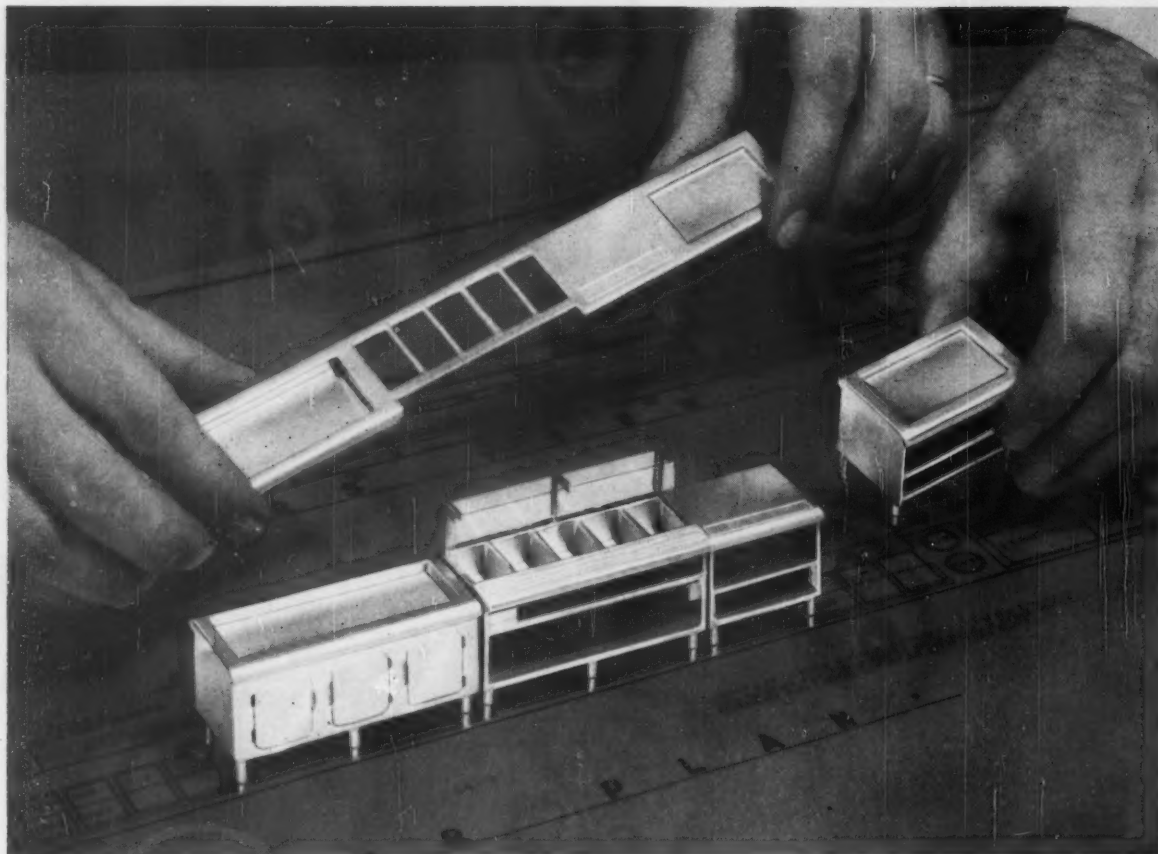
Sloan Valve Company pioneered the development of vacuum breakers and was first to gain approval from the National Plumbing Laboratory which formerly tested such devices. Sloan Vacuum Breakers, sensitive to the slightest vacuum, incorporate double protection to prevent back-syphonage as follows:

When a vacuum occurs in the supply line (as indicated in Fig. 2), two things happen simultaneously. The swinging check instantly seats against the water port to prevent back-syphonage; and, as it swings, it opens the air port, admitting full atmospheric pressure to the fixture, which again prevents back-syphonage.

This superior vacuum breaker represents another achievement of Sloan engineering, constantly employed to assure outstanding products through research. It is one more example of that bonus of quality you expect from Sloan. And, since you can have Sloan quality at no extra cost, why not make sure you get it.

SLOAN FLUSH VALVES

SLOAN VALVE COMPANY • 4300 WEST LAKE STREET • CHICAGO 24, ILLINOIS



Q: who takes the problems
out of planning
efficient food service?

A: **BASTIAN-BLESSING**

Listed under "Restaurant
Equipment and Supplies" in
all cities over
10,000 population



Manufacturer of the revolutionary CUSTOM-MODULAR cafeteria equipment, for custom quality and appearance, *without* "custom" price penalty or delays! Shown above are models from a large selection of engineered, tested and use-proved units with custom-fabricated seamless continuous top.

FOR THE ANSWERS TO YOUR PROBLEMS, MAIL THIS COUPON TODAY!

The Bastian-Blessing Company
4201 West Peterson Avenue
Chicago 46, Illinois, Dept. 17-B

Please tell us more about the Custom-Modular line and the Bastian-Blessing Planning Service. We are considering:

- ☐ Modernizing ☐ Expanding
☐ New Construction

NAME _____
TITLE _____
COMPANY _____
ADDRESS _____
CITY, ZONE, STATE _____

- ☐ Send our architect information about Bastian-Blessing. His address is:

NAME _____
COMPANY _____
ADDRESS _____
CITY, ZONE, STATE _____

THE *Nation's Schools*

THE MAGAZINE OF BETTER SCHOOL ADMINISTRATION

FEBRUARY 1960

- | | |
|--|--|
| A Plan for Quality in Science Education
<i>To develop guidelines for action, investigate the science program from four general positions: objectives, curriculum, personnel and budget.</i> | 65 Robert H. Carleton
John W. Renner |
| National Science Foundation Upgrades Teaching of Science
<i>With inservice institutes, fellowships and traveling libraries, N.S.F. works to improve science teaching.</i> | 69 NSF Staff |
| Outstanding Practices in Secondary Schools
<i>The nature of science courses and the type of equipment and facilities used are among topics reported in a TNS study of secondary programs in outstanding systems.</i> | 77 Leo E. Buehring |
| An Audio-Visual 'Natural'
<i>Carefully selected audio-visual media contribute to science instruction and are suited to large group demonstrations.</i> | 90 Walter A. Wittich |
| Purposeful Science for Elementary Grades
<i>Fifty-two districts in 36 states answer questions about the content, purposes, and resources and methods used in their elementary science programs.</i> | 91 John Sternig |
| Teachers and Scientists Form New Partnership
<i>Scientists and teachers have an unusual opportunity to develop cooperatively a science curriculum.</i> | 99 John R. Mayor |
| Myriad of Teaching Aids Enhance Quality of Instruction
<i>Manufacturers of laboratory apparatus and furniture emphasize both quality and quantity to meet today's classroom needs.</i> | 100 Staff |
| New Laboratory Solves Space, Supervision, Safety Problems
<i>A single-station science laboratory is found to be safer, easier to supervise, and less congested.</i> | 102 Lyle Watson |
| A New Emphasis on the 'How' of Physics
<i>Students learn to measure physical notions and how to assemble and use instruments in this new physics course.</i> | 104 Elbert P. Little |
| Principles for Planning
<i>Teacher attitudes toward administration of the science program and adequacy of equipment are revealed in this survey.</i> | 106 James R. Irving |

Vol. 65 No. 2

©The Modern Hospital Publishing Company, Inc., 1960

Continued on next page

Editorial Director:
ROBERT M. CUNNINGHAM JR.

Editor:
ARTHUR H. RICE

Feature Editor:
LEO E. BUEHRING

Assistant to the Editor:
JAMES J. BETCHKAL

Assistant Editors:
MILDRED WHITCOMB
MARJORIE WENGER

Editorial Assistant:
PAT RUSSELL

Art Director:
LOIS BAUMAN

Audio-Visual Consultant:
W. A. WITTICH

Business Administration Consultant:
B. R. OOSTING

School Lunch Consultant:
MARY DEGARMO BRYAN

Advertising Director:
J. W. CANNON JR.

THE Nation's Schools

Contents Continued From Page 3

Today's Facilities and Equipment 107 C. L. Koelsche

Many schools lack adequate laboratory space and proper equipment storage facilities, according to a seven-state survey of 855 schools.

Partners in Maintenance 118 G. W. Brekke

A California school reduces costs by using an outside cleaning firm with the district's custodial employees.

Our Daughter Is an 'Ambassador' 120 F. J. Gottfried

A superintendent's daughter is doing her best to be an ambassador of good will as a student abroad.

OPINION POLL

No Smoking Areas for Students 32

An emphatic "No!" to smoking in school is voiced by a majority of administrators. It's unlawful, unhealthful and immoral, they say.

SCHOOLHOUSE PLANNING

Cluster Plan Fits Rapid City's Needs 114

Rapid City, S.D., chose a cluster plan for its new school because the plan provides sheltered play areas, allows for expansion, and reduces fire danger.

SCHOOL LUNCH

The Second Goal of School Feeding 48 J. S. McAllister

If food service is coordinated into the curriculum through such courses as homemaking and art, the second goal of learning will be facilitated.

SCHOOL LAW

Why School Boards Need Legal Counsel 122 Lee O. Garber

A school board is found innocent of corrupt conduct when it is made clear that members were following legal advice in good faith.

OTHER FEATURES

Administrator's Clinic	6
Chalk Dust	24
On the Shelf	26
Report From Washington	34
Book Shelf	55
Looking Forward	63
News in Review	128
Coming Events	160
About People	162
What's New for Schools	177
Index to Advertisers	227



Editorial and publishing offices, 919 N. Michigan Ave., Chicago 11; Eastern office, 119 W. 40th St., New York 18; Cleveland advertising office, 321 Hanna Bldg., Cleveland 15. Western states advertising representative, Wettstein, Nowell & Johnson, Inc., Los Angeles, San Francisco.

Published monthly by The Modern Hospital Publishing Company, Inc. (subsidiary of F. W. Dodge Corporation), 919 N. Michigan, Chicago 11, Ill., U.S.A. Irving W. Hadsell, president; Robert F. Marshall, executive vice president; Robert M. Cunningham Jr., vice president and editorial director; H. Judd Payne, vice president; J. W. Cannon Jr., assistant vice president; Stanley R. Clague, secretary; Howard M. Thompson, treasurer. Subscriptions, 1 year, \$4; 2 years, \$6. Outside U.S., U.S.P., Canada, 1 year, \$6; 2 years, \$10. Current copies, \$1 each. Member, Audit Bureau of Circulations; Associated Business Publications; Educational Press Association of America. Microfilms, University Microfilms, 313 N. First St., Ann Arbor, Mich. Second-class postage paid at Chicago, Ill., and at additional mailing offices. Published on the 20th of the month preceding date of issue. Allow 30 days in advance of publication date for change of address.

Change of address notices, undeliverable copies and subscription orders should be sent to: THE NATION'S SCHOOLS, Circulation Dept., 919 N. Michigan Ave., Chicago 11, Ill.

B-G meets the challenge with the latest in school shop supplies

"Creating and Coping with Change" has been the very keystone of Brodhead-Garrett's growth and success in its reputation as Headquarters for Industrial Education Equipment and Supplies.

FROM THE DAYS of the little red school house, Industrial Education curriculum, facilities and equipment have grown enormously in size and breadth.

TODAY MODERN streamlined buildings designed to incorporate every modern advance in healthful and efficient surroundings dot even the rural areas.



WHERE 50 YEARS AGO, a few schools offering industrial education were considered abreast of the times by including courses and equipment in metal and woodworking, today their number has multiplied, as has the field of Industrial Education grown, reaching into every section of the country to keep pace with the modern strides that have ushered in the electronic age.

THROUGHOUT ALL THIS GROWTH in Industrial Education, Brodhead-Garrett has continuously kept step with the needs of students and their instructors. In many many cases, our closeness to problems even before they arose and their need of solutions have challenged us—and found us meeting the challenge—in the development of new designs, methods and equipment. As America's leading supply source for school shops, the constant challenge of coping with the changes and expansion in curriculum in Industrial Education has been, and will continue to be met, by Brodhead-Garrett.

Visit us at the Atlantic City Show
BOOTHS NO'S. H1 and H3.



BRODHEAD-GARRETT CO. 4560 East 71 St., Cleveland 5, Ohio
Lumber, Machinery, Benches, and Hand Tools

ADMINISTRATOR'S

CLINIC

By CALVIN GRIEDER

Professor of School Administration
University of Colorado

Is the Authoritarian Becoming Respectable? . . .

DECISION MAKING seems to be the phrase currently most in favor in discussion and research on administration. And there can be no doubt that it is one of the essential elements — some claim the essential or critical element — of administration.

But in some of the literature relating to decision making there is what sounds to me like an ominous overtone of authoritarianism. In fact, the word "authoritarianism" is not such a bad word any more.

Look at this excerpt from a sales letter for a film, "How To Create the Best Climate for Decision Makers":

"Everyone likes to work for a boss who can and will make a decision. Recent scientific research and reports from key executives in industry indicate a trend toward authoritarian management. It is now realized in many quarters that it's the job of the supervisor to get people to get the work out, rather than merely to get along as compatibly as possible."

And from business administration journals, these excerpts quoted in support of the sales pitch:

"The Case for Benevolent Autocracy," *Harvard Business Review*, January-February 1958: "Benevolent autocracy gets its results because it rigidly structures, routinizes and controls the relation of the supervisor to his subordinates . . ."

"Authoritarian Management: A Reviving Concept?" *Personnel*, January-February 1959: "Though authoritarianism seems to connote something that runs counter to our ideas of good human relations, here's some evidence that suggests this isn't necessarily so . . . The findings of the critics, combined with the startling industrial progress shown by the Communist world,

have resulted in a somewhat more critical re-evaluation of the entire question of democratic vs. authoritarian leadership."

"Business Needs Mature Autocrats," *Nation's Business*, September 1958: "The democratic approach to business administration and leadership seems to have reached its apex; . . . challenge to democratic approach to managing suggests a more effective type of executive; . . . what kind of executives do we need and want? . . . 'Caesar' type of leader, a man who walks with a firm but quiet step."

It doesn't look as though the representatives of the business and industrial community can be depended upon for advancing administration, for these sentiments are distinctly reactionary. They assuredly do not apply to educational administration. They sound more applicable to "a peasant economy." But are such expressions, beginning to appear with more frequency, the sign of a change in our profession of and our allegiance to democratic principles?

Three Suggestions for Flexible Retirement Plan

It is rather surprising that so little attention has been given in education to abolishing uniform age requirements for retirement. In some states and city school systems, when a specified age, such as 65 or 70 is reached, an employee has no choice but to retire, and the governing board may also have no choice. (Sometimes it can change the rule if it is only a board rule and not a law or a requirement of the state retirement plan.)

The perennial need for teachers at all levels, a need that seems to be di-

minishing not a bit and, in fact, in higher education becoming critically acute, would lead one to think that developing more flexible policies on retirement would be seriously undertaken. Because a flexible policy is much more difficult to administer than a uniform rule may be the reason why it has not. But this is not a good reason, for administrators are paid higher salaries than others, at least in part, because of the problems and difficulties their work entails.

Three conditions should be fulfilled in a flexible retirement plan, in deciding if an elderly employee is to be retained, say, on full time, three-fourths time, half-time, or one-fourth time:

1. Is he needed on the staff?

2. Does he want to stay on the staff?

3. Is he physically and mentally fit to remain on the job?

On the last question, mental fitness would be difficult but probably not impossible to assess. Impairment of mental health would probably rule out employment completely unless it was of a very minor nature. Physical health, on the other hand, might well be such that a person could carry quite satisfactorily a part-time but not a full-time work load. So a scale of employment to fit individual cases, as suggested above, could be adopted.

Other problems are associated with flexible retirement policy, but the three questions given are the nub of the matter. Somebody ought to start a campaign.

Second Thoughts on Interscholastic Competition

In general, reaction to the Clinic for November, in which the educational values of interscholastic athletics were questioned, has been favorable. Schoolmen in several states have written or told me that they agree fully in principle but do not know just how to go about getting changes made. I should also report that several pointed reminders have come my way from English friends and from Americans who have studied or visited in Britain to the effect that athletic competition not only exists there but is also very keen. This is especially true of the grammar schools, which are mainly academic prep schools for the universities.

In the November Clinic I said that interscholastic athletic competition was "almost nonexistent." I should have added the clause, "as we know



Where durability counts the Boston all metal sharpener is the answer. All models have hardened steel gears and 25% more cutting edges. There's a model for wall, window or table mounting or the Portable Champion for schools with steel interiors.

specify

BOSTON®

PENCIL SHARPENERS



The Boston Ranger . . . Heavy-duty double bearings . . . outside adjustment for 3 points.

Steel Gears . . . 30 steel cutting edges . . . 25% more cutting surface . . . 25% longer life.

Model KS . . . Durable and no messy fall-out . . . nickel plated receptacle . . . 8 size pencil guide.

quality

for economy

The longer lasting rugged Boston Pencil Sharpener will give you longer service with less maintenance. Be sure to specify Boston for economy and quality.



C. HOWARD HUNT PEN COMPANY, CAMDEN 1, NEW JERSEY

EDITORIAL CONSULTANTS

ADMINISTRATION

John Guy Fowkes.....University of Wisconsin
Calvin Grieder.....University of Colorado
James M. Spinning.....Rochester, N.Y.
Herman L. Shibley.....Indianapolis

BUSINESS

B. R. Oosting.....Hinsdale, Ill.
Francis R. Scherer.....Rochester, N.Y.
John W. Lewis.....Baltimore
A. C. Hutson Jr.....Knoxville, Tenn.

FINANCE

Ernest G. Lake.....Fullerton, Calif.

INSTRUCTION

Willard E. Goslin.....George Peabody College

PERSONNEL

C. C. Trillingham.....Los Angeles County
K. E. Oberholzer.....Denver

STATE ADMINISTRATION

J. C. Wright.....State Supt., Iowa

RURAL SCHOOLS

Julian E. Butterworth.....Ithaca, N.Y.
M. L. Cushman.....University of North Dakota

INTERPRETATION

Harold C. Hunt.....Harvard University
Paul J. Misner.....Glencoe, Ill.

SCHOOL LAW

Lee O. Garber.....University of Pennsylvania

SCHOOL LUNCH

Mary deGarmo Bryan.....Columbia University

SCHOOL PLANT

Ray L. Hamon.....George Peabody College
John H. Herrick.....Ohio State University
Thomas J. Higgins.....Chicago
John L. Cameron.....U.S. Office of Education

AUDIO-VISUAL

Walter A. Wittich.....University of Wisconsin

HIGHER EDUCATION

David D. Henry.....University of Illinois

EDITORIAL ADVISORY BOARD

Homer W. Anderson.....Lakeland, Fla.
S. M. Brownell.....Detroit
Irby B. Carruth.....Austin, Tex.
Francis S. Chase.....University of Chicago
Forrest E. Conner.....St. Paul
C. L. Crawford.....Mankato Teachers College
E. N. Dennard.....Newton, Mass.
John R. Emens.....Ball State Teachers College
Finis E. Engleman.....Exec. Secy., A.A.S.A.
Martin W. Essex.....Akron, Ohio
Wendell Gedwin.....Topeka, Kan.
F. G. Hochwalt Nat. Catholic Welfare Confer.
I. Harold Husband.....Grosse Pointe, Mich.
Schuyler C. Joyner.....Los Angeles City
H. M. Kallen New School for Social Research
James D. MacConnell.....Stanford University
Hollis A. Moore Sr.....Tyler, Tex.
Robert D. Morrow.....Tucson, Ariz.
P. M. Muir.....Toronto, Ont.
J. F. Redmond.....New Orleans
W. C. Reusser.....University of Wyoming
Mark C. Schinnerer.....Cleveland
Paul W. Seegers.....Indiana University
Harold Spears.....San Francisco
Lindley J. Stiles.....University of Wisconsin
Edmund H. Thorne.....West Hartford, Conn.
Paul D. West.....Fulton County, Ga.
W. T. White.....Dallas
H. I. Willett.....Richmond, Va.
Benjamin C. Willis.....Chicago

it," for there is little resemblance between British and American interscholastic rivalry. In Britain these conditions obtain, as a very general thing:

As many as four or five teams are organized in some sports, including the leading sports, making a place for large numbers of boys and girls.

No paid referees or umpires.

No high pressure or high paid coaches. A "games master" or "games mistress" may very likely be a Latin or history teacher, with supervision or coaching of sports much more definitely a sideline than it is in the U.S.

No admission charged.

No stadiums and no seats for spectators.

No long trips.

No tournaments or play-offs.

No highly organized cheering sections or pep rallies.

This is what might be called low-key competition, more like sand-lot

games than the highly organized razzle-dazzle imitation of "big time athletics" that we support.

In most sections of the U.K., of course, the population is so heavy and schools are so close together that such interscholastic competition as does exist has a sort of neighborhood flavor. But the rivalry is keen, nonetheless. British boys and girls have strong school loyalty, a lot of pride in the uniform and colors of their own schools.

Girls compete more than is usually approved in the U.S., and one thing that many grammar schools do that looks bad to me is engaging in many after-school midweek games. However, this is more understandable and perhaps even excusable when one recalls that most grammar schools have a large proportion of boarding pupils, with the school responsible for them for 24 hours a day. ■

Korean Life and Letters —

and these letters spell RAY HAMON

레이. 엘. 해몬.

Former U.S.O.E. school housing chief writes from Orient

We could have talked more glibly about Korea if we had written this a month after we arrived. A lot of what we then thought we knew about Korea we have now learned is true only part of the time, for certain people and things, in some places.

Probably more American employees are working in the republic of Korea (South Korea) and more U.S. dollars are being spent here than in any of the other U.S. aid missions to underdeveloped countries. When one traces the Western defense line from Alaska to the Philippines, it is obvious that our interests in Korea are something more than a philanthropic gesture.

We are often asked how it feels to live within the range of hostile Communist guns, to say nothing of nuclear carrying jet bombers. We don't worry about it. We do, by regulation, keep our quick-departure bags packed. We were told that we might expect seven days' warning, but that is silly. It would probably be more like seven seconds; so, "What will be, will be."

On Sept. 16, 1958, I "retired" from a position I had held for 17 years as chief of the school housing section in the U.S. Office of Education. The next day I went

on duty under the Peabody College contract with the International Cooperation Administration for a two-year assignment as school building adviser to the teacher training institutions of Korea. Mrs. Hamon and I arrived in Seoul on October 6, and I immediately went to work on a difficult job. I have never worked harder, or with more satisfaction.

There are 23 public teacher training institutions: three colleges of education, two normal junior colleges, and 18 normal schools, all with inadequate and run-down physical plants. Many buildings were destroyed in the Korean War; and don't let Harry, or anyone else, tell you that it was a mere police action.

The normal schools are about four jeep-hours apart. I make the rounds every two months to inspect construction projects. Jeeping on these rough, dusty roads over beautiful mountains and through attractive valleys with their rice paddies and vegetable and barley patches and villages of little mud and straw houses is very interesting.

The Peabody contract is concerned with upgrading teacher education. We believe that this is the best long-range plan for the sociological, economic, industrial and political development of

WON'T BURN



HeyWoodite Won't Burn—Won't Stain—Won't Break

This dramatic demonstration proves that HeyWoodite is fireproof. In a recent school fire where the building was gutted, the only thing which could be salvaged was the HeyWoodite furniture. The desks and chairs required only washing before they were again ready for use.

Because HeyWoodite is virtually indestructible, it saves your school system substantial sums in maintenance year after year. Available in chair seats and backs, desk tops and tablet arms, HeyWoodite solid plastic with TrimLine lifetime chrome frames is your soundest investment for long run economy.



For free catalog,
write:



HEYWOOD-WAKEFIELD
School Furniture Division, Menominee, Michigan

Entirely Eliminates Refinishing Costs

THIS IS
PRACTICAL
MAINTENANCE...



WITH **THOMPSON**
Servisafe POLES



Only five minutes
required to replace
burn-out on 30-foot pole!

Maintaining pole-mounted luminaires really is an easy job... with "Servisafe" Metal Poles. All work is accomplished at ground level with a "dead" fixture. As a result, one man can relamp and clean a luminaire with complete safety in any kind of weather. And the only "auxiliary" equipment required is a detachable handline!

Decorative as well as functional, "Servisafe" Poles feature unique advantages that assure peak lighting efficiency with minimum annual cost. Both single and double-arm models of steel or aluminum construction are available in heights up to 35 feet.

FOR SPECIFICATIONS AND PRICES,
WRITE FOR BULLETIN PWB-59.

8210-TE



THE THOMPSON ELECTRIC CO.

P. O. BOX 873-BA

CLEVELAND 22, OHIO

this country. Like any other country, Korea's greatest asset is its children, and they have more than an abundance of that crop. In fact, the birth rate is one of their big problems. Every woman between 15 and 50 seems to be a mother.

Schools here are organized on the 6-3-3 plan, primary, middle and high school. Classes in these schools, and also in normal schools, average about 70 students, often 80 or more, and sometimes in double sessions. We are not happy about the lecture method, which is about the only class "activity" throughout the Korean schools. We are working with the school authorities trying to modify classroom procedures. But just what would you do with 80 students in a room of 20 pyong (720 sq. ft.), "equipped" with rough home-made furniture, no teaching supplies, and very few books?

Since the normal school facilities consist almost entirely of bare classrooms, I am concentrating our part of the aid program on facilities for library, home economics, science and crafts shops. Educated people of the East don't use their hands, but this is changing.

I have designed, for local manufacture, science tables for mass instruction; and classroom tables and seats that will stack, thus freeing a portion of the room for student activity. I am also working on a roof design that will utilize south winter sun for warmth, but with glare control. Central heating is out of the question, and fuel is scarce and expensive. Some classrooms have small stoves, but they don't really warm the room. Many classrooms have no stoves at all. There are days when the temperature drops below zero; and, in most of the schools, children remove their shoes when entering.

We are becoming very fond of the Koreans with whom we work in the schools and in our offices. They are efficient, intelligent, kind and cultured people. I wish that as much could be said for their highly centralized government and their politicians. Democratic action and freedom of the press are only relative terms. President Rhee, 84, is running for reelection. With press, radio and police control, the outcome is predictable.

U.S. aid has made it possible to import some goods and materials not yet available here in adequate quantities. Such purchases are made through bids on the worldwide market, and our I.C.A. regulations say we must purchase from the lowest bidder meeting specifications. Japanese firms are usually low on building materials, especially cement. Last June 15, Korea cut off all trade with Japan, thus delaying our building program. I doubt if cutting off trade is the way to solve the problem.

Mrs. Hamon is teaching 8th grade in the army school and is enjoying it. We expect to return home next August.

WON'T BREAK



HeyWoodite Won't Break—Won't Burn—Won't Stain

This dramatic demonstration proves that HeyWoodite has the highest impact resistance. Molded under extreme heat and pressure, HeyWoodite is a high density material with a smooth, permanent surface and uniform strength and color throughout.

Because HeyWoodite is virtually indestructible, it saves your school system substantial sums in maintenance year after year. Available in chair seats and backs, desk tops and tablet arms, HeyWoodite solid plastic with TrimLine lifetime chrome frames is your soundest investment for long run economy.



For free catalog,
write:



HEYWOOD-WAKEFIELD
School Furniture Division, Menominee, Michigan

Entirely Eliminates Refinishing Costs

3 BIG REASONS

WHY YOU SHOULD BE USING

SCHOOL MASTER*

FILMSTRIP and SLIDE PROJECTORS



SCHOOL MASTER 750
shown with exclusive
rewind take-up (accessory)

- ① Your teaching efforts are more effective when a School Master's brilliant projection is used. Pupils comprehend faster with the brighter, more detailed image . . . projection problems are minimized.
- ② You can use Filmstrips or 2 x 2 slides with a School Master . . . a dual-purpose machine that utilizes the two most popular and effective visual materials. Conversion from one to the other is quick and easy . . . in seconds . . . without tools or removal of parts.
- ③ You concentrate on teaching, not the projector. So simple is its mechanism . . . so sure its operation, the School Master is easy for anyone to use.

School Masters, available in 500 and 750 watt manual or remote control models, are priced from \$84.50. Exclusive accessory rewind take-up allows filmstrips to be rewound into storage container automatically.

GRAFLEX *Classic* TAPE RECORDER

The only tape recorder designed specifically
for School Audio Visual Programs

Weights only 25 lbs. True high fidelity performance. Push-button operation. Exclusive built-in tape splicer. Two speakers plus "whizzer." Sturdy carrying case with storage space for tapes, and microphone. 3-wire power cord. Built-in power transformer. UL and CSA approved. Only \$244.50.

For additional information on the equipment shown, see your Graflex A-V dealer. Or, write Dept. NS20, Graflex, Inc., Rochester 3, N. Y. A subsidiary of General Precision Equipment Corporation.

Prices subject to change without notice.

*Registered Trademark



GRAFLEX®

A
GENERAL
PRECISION
COMPANY

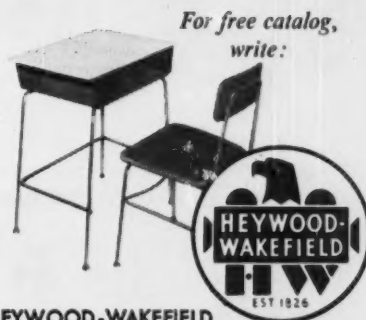
WON'T STAIN



HeyWoodite Won't Stain—Won't Burn—Won't Break

This dramatic demonstration proves that HeyWoodite's non-porous surface has positive stain resistance. Molded under extreme heat and pressure, HeyWoodite has the same strength, the same high density and color throughout. Surfaces and edges have permanent smoothness and uniformity.

Because HeyWoodite is virtually indestructible, it saves your school system substantial sums in maintenance year after year. Available in chair seats and backs, desk tops and tablet arms, HeyWoodite solid plastic with TrimLine lifetime chrome frames is your soundest investment for long run economy.



*For free catalog,
write:*

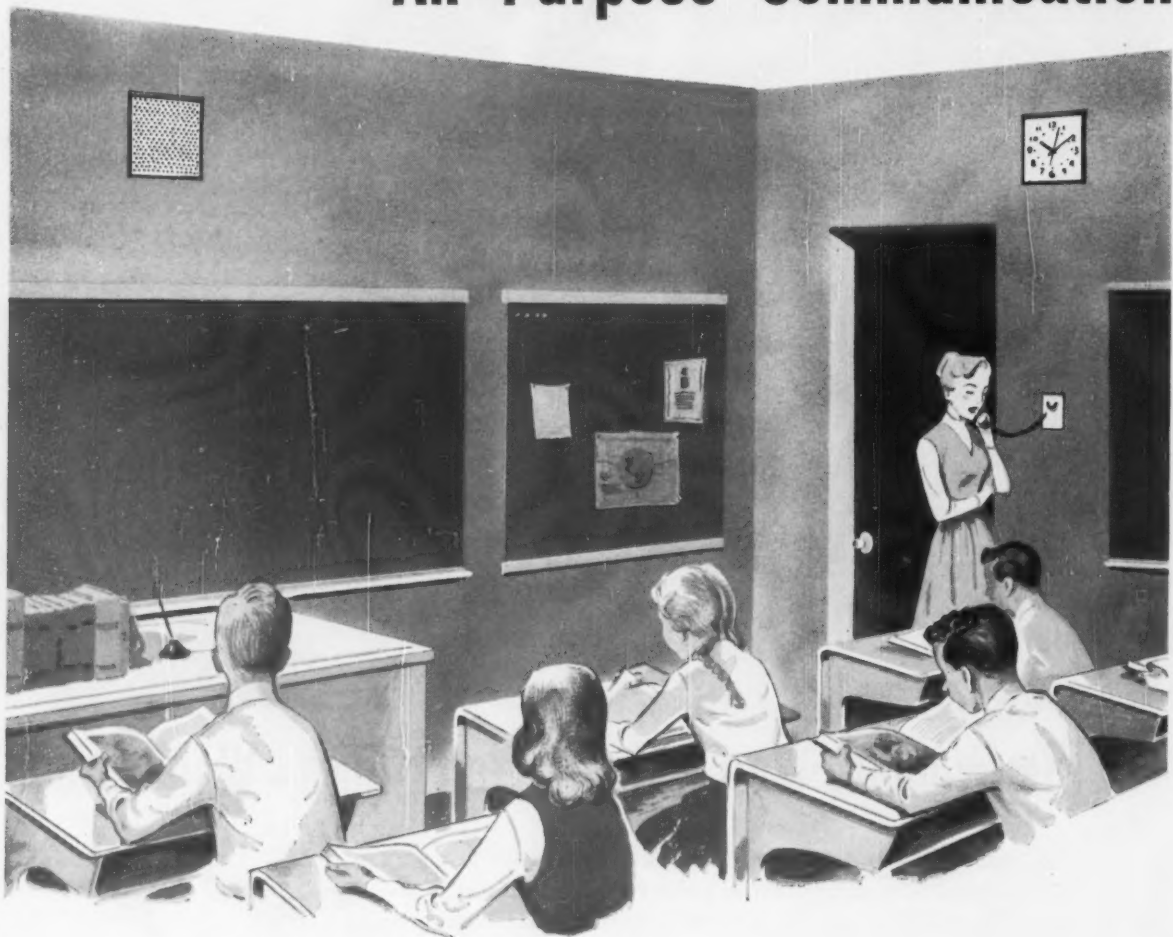
HEYWOOD-WAKEFIELD
School Furniture Division, Menominee, Michigan

Entirely Eliminates Refinishing Costs

Introducing **PRACTI-CALL[®]**

The Practical...

All-Purpose Communication



- Telephone permits private, two-way communication (90% of all requirements).
- Wall speaker provides for general announcements, emergency instructions, special events, etc. (10% of all requirements).
- Wiring is in same conduit as clock and program system . . . permitting substantial installation savings.

PRACTI-CALL system is incorporated
as part of clock and program system
... utilizes same conduit, existing bell
control board (background)
... is operated by office secretary.

System



"Functionalism Without Frills"

Here at last is an economical, completely practical communication system designed especially for schools ... a system that makes sense (and saves dollars).

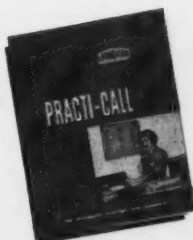
PRACTI-CALL fills all school communication needs:

1. General announcements, news, special events, emergency instructions, etc. are communicated to all classrooms simultaneously through an "all call" speaker system.
2. Conversations requiring privacy (approximately 90% of all intra-school communication) are carried on over a private telephone system.

With all its flexibility of use ... an adaptability never before available ... PRACTI-CALL costs substantially less. No bulky, high cost console ... no intricate mechanisms to go awry. PRACTI-CALL is the sensible sound system designed by STANDARD—leader for 75 years in the development of superior electrical systems for schools.

IMPRESSIVE INSTALLATION SAVINGS—All basic wiring runs in the same conduit as the school's clock and program system ... effecting additional important savings on installation.

PIN-POINTED RESPONSIBILITY—From an operational viewpoint, there's also this reassuring thought: service, whether on your clock and program system or your communication system, is from a single source when PRACTI-CALL is specified with a STANDARD program system. STANDARD stands behind both systems ... with a service organization ready—nationwide—to provide immediate service. One call covers all.



Request Bulletin No. 248 containing
complete detailed information.



THE STANDARD ELECTRIC TIME COMPANY

89 LOGAN STREET • SPRINGFIELD, MASSACHUSETTS

NATIONAL

CLASSROOM CABINETS

GIVE MAINTENANCE-FREE SERVICE!
.....

*And
rough
treatment
doesn't
haze
them!*



You'll practically eliminate maintenance costs when National cabinets are installed. Their lifetime surfacing of Nevamar high-pressure plastic laminates stay new-looking, resist scars and stains and will never need painting or refinishing. Precision engineering and the full range of styles and sizes fit National cabinets into any classroom design. They are the result of the best thinking of leading school architects and administrators—designed to give you a sure investment in long-range economy. Write for brochure and sample of Nevamar.

surfaced with
NEVAMAR®

- ▶ A HIGH PRESSURE LAMINATE
- ▶ RESISTANT TO CIGARETTE BURNS
- ▶ WITHSTANDS BOILING WATER
- ▶ DESIGNED FOR LONG LIFE AND LASTING BEAUTY
- ▶ WON'T CRAZE, CRACK OR PEEL IN NORMAL USE
- ▶ NOT AFFECTED BY ALCOHOL, FRUIT ACIDS, AMMONIA, ORDINARY INK . . . OR TIME
- ▶ NEVER NEEDS PAINTING
- ▶ EASY TO CLEAN



SEE US AT THE A.A.S.A. CONVENTION

BOOTHS 1339-41-43

FEB. 14 TO 17-ATLANTIC CITY

NATIONAL SCHOOL FURNITURE COMPANY

DIV. OF NATIONAL STORE FIXTURE CO., INC. • ODENTON, MARYLAND

A COURAGEOUS STEP FORWARD

...toward accelerating school science teaching to fulfill the objectives of the National Defense Education Act has been accomplished. The new Purchase Guide just distributed by the Council of Chief State School Officers gives every school the requirements for basic, standard and advanced equipment for science teaching.

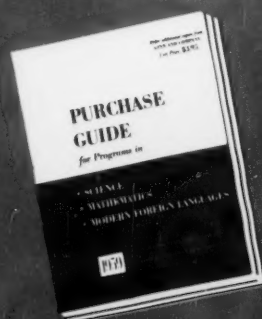
"This is quite an exciting thing to me," said United States Commissioner of Education, Lawrence G. Derthick. "It should help stretch the educational dollar further and improve the standards of instruction.

"When teachers in these areas covered (Science, Mathematics and Foreign Languages) are given money to buy new equipment, they will have master lists available to show them what equipment they should have, and how much use they can expect to get from it."

"Some State School Superintendents are known to be considering making the Guide the official standard for all systems under their jurisdiction so that schools will use the National Defense Education Act money wisely," says Andrew Bingham, Staff Writer of the Sunday Star, Washington, D. C.

Congratulations are in order. Bausch & Lomb joins the thousands of educators who are saying to the host of workers responsible for this monumental 344-page book, "Thank you for a tremendous job well done."

BAUSCH & LOMB OPTICAL CO.



"Widespread use of this book will discourage routine purchase and use of obsolete materials and apparatus, while encouraging the manufacture, purchase and use of more modern teaching aids. The Purchase Guide should reduce sales of shoddy, uneconomical, or inappropriate items and assist reputable manufacturers in making products of high quality and usefulness that can be sold at reasonable prices. It should arm school authorities against high-pressure sales tactics and enable them to become better informed about what to purchase and how to get full value for school funds expended. Most important of all, the Purchase Guide should advance the content and quality of instruction in the sciences, mathematics and modern foreign languages."

From the Foreword

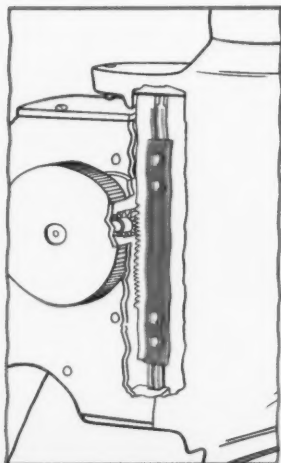


To get comprehensive information, illustrations, specifications and prices on the Bausch & Lomb line of Standard Teaching Microscopes and other products which fulfill the requirements of the Purchase Guide...

Just fill in and mail this card. There is no obligation, of course.



Now Even More Student-Proof



Two new budget-saving reasons why
Bausch & Lomb outwears them all

EXCLUSIVE

New Lifetime Ball-Bearing Focusing

To resist rough handling for *even more* extra years of use, B&L Standard Teaching Microscopes now feature the most wear-free focusing ever offered in the school budget range. Eight stainless steel ball bearings in hardened steel raceways float the slide and assure perfect smoothness, precise centration. An automatic stop prevents removing the tube and eliminates the possibility of stripping the rack gear. This new design gives you *even more* trouble-free service — an added benefit with no increase in price — to make your best buy even better.



EXCLUSIVE

New Force-Proof Clutch

Prevents damage to fine adjustment mechanism, objectives and specimens. When the end of the fine focus travel is reached, the safety clutch takes over — even if the fine focus knob is forced beyond its range, there's no damage to any part of the focusing assembly. Now your best buy is even more student-proof.

PLUS

Standard size, standard operation, with laboratory-grade optics, made in America by Bausch & Lomb. Lifetime warranty; nation-wide service by qualified B&L dealers. Meeting the requirements of Purchase Guide Items Nos. 2625, 2645 and 2650. As low as \$112.50 each, in lots of five.

See the complete line of Bausch & Lomb Science Teaching Aids at the School Conventions: AASA, Atlantic City, February 13-17; NSTA, Kansas City, March 29-April 2; NCEA, Chicago, April 19-22.

BAUSCH & LOMB OPTICAL CO.
635 St. Paul St., Rochester 2, N. Y.

VIA AIR MAIL

BUSINESS REPLY MAIL

No postage stamp necessary if mailed in the United States

BAUSCH & LOMB OPTICAL CO.
635 St. Paul Street
Rochester 2, N. Y.

Instrument Division

FIRST CLASS
Permit No. 7
Rochester, N. Y.

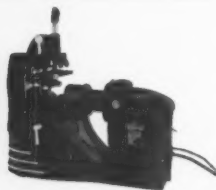


STEREOZOOM* MICROSCOPES

A really new concept in microscope optical design, continuously variable magnification, not in steps but infinite within the range. No objectives to misplace, scratch or break. No nosepiece to get out of order. Completely enclosed optical Pod keeps out dirt, protects against damage. Lower prices begin at \$202.50 in lots of five.

Meeting the requirements of Purchase Guide Item No. 2655.

*Trademark, Bausch & Lomb Optical Co.



BASIC ILLUMINATING UNIT

So ingeniously simple that anyone can learn to operate it in just a few minutes. Carbons are clipped into place in "one-two-three" fashion and kept correctly spaced for at least an hour's continuous use by electronic controller. Although strong and rigidly built, it's easily portable. Complete, without microscope, \$405.00.

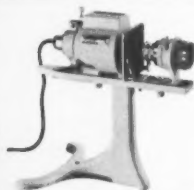
Meeting the requirements of Purchase Guide Item No. 2640.



BUNSEN SPECTROSCOPE

Easily movable prism to demonstrate different light characteristics. Linear scale can be calibrated. Spectral lines appear sharp and clear — enhancing normal dispersion of the prism. Price, \$150.00.

Meeting the requirements of Purchase Guide Item No. 3855.



TRIPLE PURPOSE MICRO-PROJECTOR

Projects downward onto a table with stage horizontal for live specimens in liquid or for drawings; to wall with stage horizontal or vertical. Weighs only 5¼ lbs. and is the simplest to operate. Complete for A-C, \$100.00.

Meeting the requirements of Purchase Guide Item No. 2605.



EYEPIECE PHOTOMICROGRAPHIC CAMERA

35mm Camera with viewing head attaches directly to microscope eyepiece and permits viewing specimen during focusing and even while snapping the picture. All optics are Balcote® treated. Price, \$233.50.

Meeting the requirements of Purchase Guide Item No. 0690.



TRI-SIMPLEX MICRO-PROJECTOR

Bausch & Lomb standard quality optics give clear, bright color-true screen images. Projects to wall or table-top with stage in horizontal position, or to wall with stage vertical. Weighs only 16 lbs., but is well-balanced and designed to last through many years of classroom use. From \$150.00.

Meeting the requirements of Purchase Guide Items Nos. 2610 and 2615.

BAUSCH & LOMB OPTICAL CO., 635 St. Paul St., Rochester, N. Y.

Prices subject to change.

Send me all the information on the following instruments meeting The Purchase Guide requirements:

- | | |
|--|---|
| <input type="checkbox"/> Standard Teaching Microscopes | <input type="checkbox"/> Triple Purpose Micro-Projector |
| <input type="checkbox"/> StereoZoom* Microscopes | <input type="checkbox"/> Eyepiece Camera |
| <input type="checkbox"/> Basic Illuminating Unit | <input type="checkbox"/> Bunsen Spectroscope |
| <input type="checkbox"/> Tri-Simplex Micro-Projector | |

You may give me an obligation free demonstration of _____

MY NAME _____ POSITION _____

SCHOOL _____

ADDRESS _____

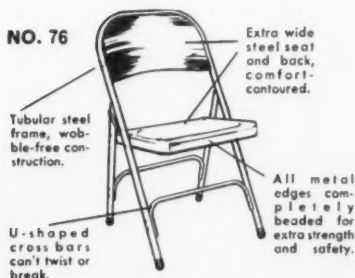
*Trademark, Bausch & Lomb Optical Co.



Hampden Folding Chairs can really take it!

EXTRA STURDY...FOR EXTRA YEARS OF SERVICE!

NO. 76



Chairs also available with tablet arm; steel, padded, wood or foam rubber seat.

Whatever the burden, wherever the need, Hampden adult and juvenile public seating chairs give the best service! In quality, style, construction and value, Hampden chairs top the field in every price range.

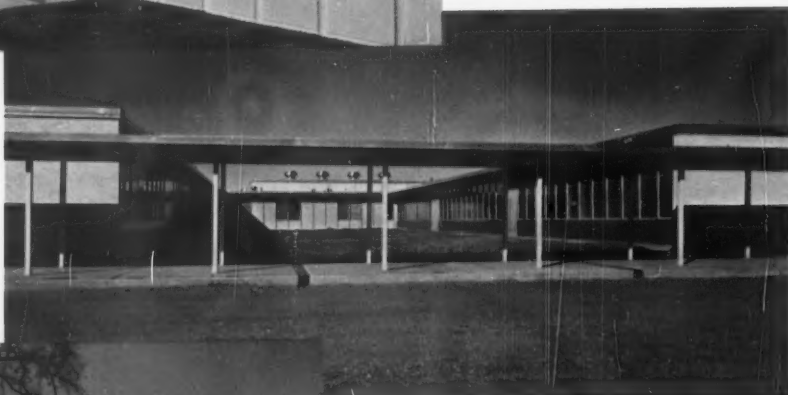
Strength, comfort and style combine in Hampden chairs . . . they thrive on rugged use, and they're economical too! Largest seat and back in the industry . . . contoured for comfort. Won't tip . . . fold easily — and flat!

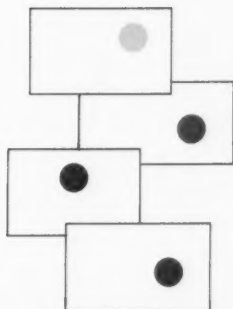
Enamel bonded on . . . rust resistant. So much extra value for so little money! WRITE for catalogue: Dept. B-5, **HAMPDEN**, Easthampton, Mass.

Hampden

Manufacturers of:

PUBLIC SEATING • OUTDOOR and JUVENILE FURNITURE • BRIDGE SETS





You can have a distinctive new AmBridge Modular School ready for the fall term.

It takes far less time to construct a USS AmBridge Modular School, because it's built with precision fabricated steel components that arrive at the job site ready for erection. The panels are available in 47 color-fast shades. Here are four beautiful examples of USS AmBridge Modular Schools: ● Evans City Elementary School, Evans City, Pennsylvania. Twelve Classrooms. Architect: B.J. McCandless, A.I.A. ● Bridge City Elementary School, Bridge City, Texas. Twenty-four Classrooms. Architect: Goleman & Rolfe. ● Howard Seminary, West Bridgewater, Massachusetts. Eleven Classrooms. Architect: Harvey & Provost. ● Elwyn Training School, Elwyn, Pennsylvania. Twenty-three Classrooms. Architect: G. C. Freeman. Hint: If you're planning a new school or an addition, write for our 24-page booklet on AmBridge Modular Schools. Ask for an extra copy and give it to your architect. American Bridge Division, United States Steel, Room 1831-A, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

USS and AmBridge are registered trademarks

**American Bridge
Division of
United States Steel**



PAYOLA

Dear Chalk Dust:

JUDGING by some of the remarks during recent TV investigations, everybody but school superintendents is getting payola. I am not sure just what payola is because Mr. Webster, my favorite investigator, doesn't even mention it in the latest edition of his fascinating book, so probably he doesn't get any, either. It appears, however, that payola is some sort of income that is exempt from taxation.

When and how does one get payola, anyway? I have appeared on TV a number of times to defend the school budget, and all I ever received was a lot of nasty letters and an advertisement for accident insurance. When my board of education demanded that one-fifth of the graduating class be pulled through mathematics to please Vice Admiral Rickover, did they give me any payola? Not on your life — they didn't even give me an option.

And when I made a job for my board president's son, passed his daughter into the graduating class, hired his secretary because his wife didn't want her around, gave his aunt a position as librarian, and refused to sue when his dog bit my leg, he refused to sign my contract because he said: "What have you done for me lately?"

I ask you, Mr. Chalk Dust, is that payola?

Yours in the bonds,

W.L.B.

SCIENCE IN SUGARTOWN

THE HARNESSING of science to the well known peeping ability of the Russkies has enabled them to be the first to get a peek at the back-side of the moon. This scientific, and possibly even escatological, event has caused considerable embarrassment to American educators, as it probably has to the Moon People themselves. It is further rumored that the U.S.S.R. is planning to follow up their sneak preview by shooting a few of their heroes into space provided they have not already shot them in some other parts of their anatomy.

Despite these discomfiting events, many educators believe that more young Americans know more about science than in any other country this side of the Milky Way. They assert that the Soviet's moon shooting is more in the field of political science than in pure science and that political science is not always pure.

Confusing as these assertions are, they are certainly strengthened by a perusal of the Administration Study of Science Education in this issue of *The Nation's Schools*. Never has so much concern and understanding about science teaching been set forth in so few pages. The study not only proves how important is science, but it suggests what to do about it. In my opinion, the greater value lies not in the erudite articles but in the advertising pages.

It is a melancholy fact that, in the field of science, the educators have not always been able to keep up with the inventors, purveyors, exhibitors and salesmen of scientific equipment and apparatus. The school administrator, sputniked by nonscientific budgets and plastered by blueprints, has too often been content to use ancient textbooks and inadequate scientific equipment salvaged from the community ash cans and the school midden. With averted eyes, he has hurried past the exhibitors' booths at Atlantic City to solace himself with a free glass of tomato juice. Sorrowfully, he has ignored the inviting displays featuring plasticized electronic skeletons or rubberized world globes as they bounced merrily on their south poles. It may be that he felt he had plenty of skeletons in his curriculum closets at home. It may be that he was opposed to any kind of an

inflated world. But the sad fact remains that he felt that he was doing his duty to science by purchasing a few decaying amoebae or collecting sample yardsticks for his faculty.

Of course, not all school administrators are scientifically oriented. Back in Sugartown in the pre-moon era, the teaching of science was divided into three parts only. If the springtime were unusually fecund, frogs could be gathered free from every pond, and this provided an economical emphasis on biology. A surprising knowledge of genetics was learned by the farm pupils, who had some fine nearly open-air laboratories, but this learning was largely extra-curricular. In mining communities, where iron filings were abundant, students were taught the laws of magnetic fields in physics. Chemistry was a matter of broken bunsen burners heated by candle stubs left over from the candlelighting orgies of the P.T.A. or the Eastern Star. All other equipment was homemade.

According to Gresham's law, the homemade equipment still prevails. In fact, one state education department has recently issued a do-it-yourself brochure showing how to self-equip a laboratory. Probably the brochure was written by the same character who proved that empty orange crates make an admirable school library and thus started an economy fad on which thousands of teachers have ruined their nylons. Of course, the do-it-yourself idea has some merit. When the equipment blows up a student or two, a place is provided for others clamoring for an in.

The Science Study may help to change this situation. We hope it will inspire the budget-makers into an examination of their conscience and their figures.

HOW IT ALL BEGAN

MODERN CURRICULUM tinkerers owe a great debt to Ogg, the Stone Age curriculum expert, who actually started the whole disturbing business. When Ogg was first employed by the Stone Age Board of Education, he was given instructions to think up a curriculum that would help the merry little juvenile delinquents of that golden era to drag-race a chariot, pick up a fast clam shell, or be able to answer all quiz questions on TV. Ogg thought up a curriculum that stressed the cardinal principles for survival. It included cave building, trap setting, mastodon dodging, war worrying, and moon appreciation. This curriculum was hailed with assorted enthusiasm and, like his more modern successors, Ogg was showered with praise and brickbats.

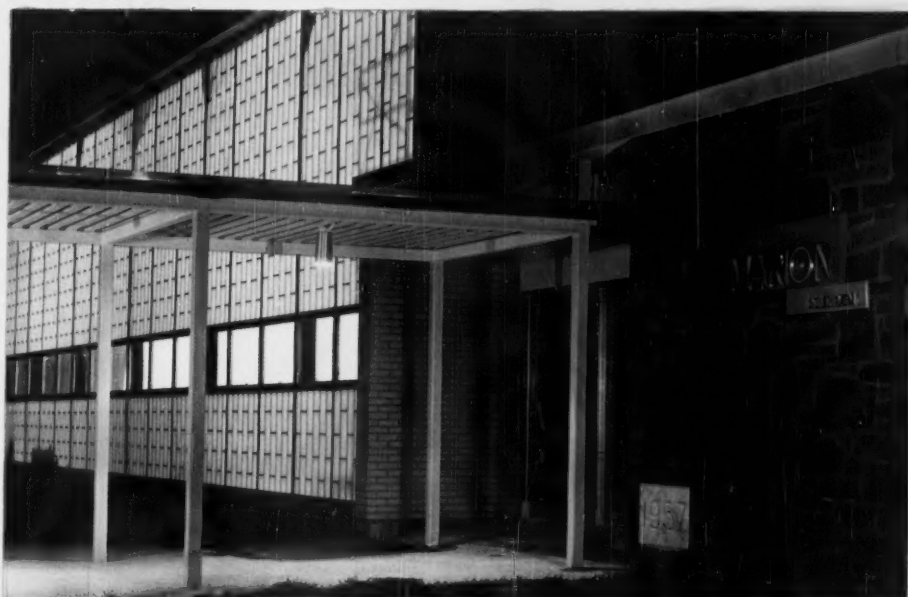
Unfortunately, the later educational achievements of Ogg, if any, have been lost in the mists of antiquity, for he was shortly replaced by a young Neolith whose uncle had some fine connections at City Hall. It is evident, however, that the Ogg curriculum has a great deal of merit. In fact, the way things are going around here, it reads like a prophecy and may soon find a place in every school.

QUOTE OF THE MONTH

IN CONSCIENTIOUS ATTEMPT to keep abreast of current youth literature, many school superintendents scan the "true confessional" magazines confiscated in classrooms. They are seldom surprised at the candor and frankness they find. It is amusing to discover the same sort of frankness exhibited by Vice Admiral Rickover in his latest blast at education (*Saturday Evening Post*, Nov. 28, 1959). Says the submarine expert: "Even persons who are competent in a particular field, but otherwise deficient educationally, show the same tendency to overvalue their capacity and to interject themselves into areas where they lack competence."



This page and other content in this magazine is copyrighted and may not be reproduced without permission.



Mount Marion School, Saugerties, New York • Architects: Sargent, Webster, Crenshaw & Folley

Walled with light . . . yet a Kalwall translucent school costs less to build . . . less to heat . . . less to maintain

Architects who design school buildings around Kalwall translucent panels are using one of today's most economical methods of construction.

That's because these rugged, lightweight, fiber-glass and aluminum sandwich panels eliminate the need for conventional framework — simplify and speed up construction.

Kalwall translucent panels diffuse direct sunlight

into even, glarefree illumination — ideal for school interiors. They're shatter-proof, have the highest insulation value of any light transmitting material, and the self-cleaning characteristics cut maintenance to the core.

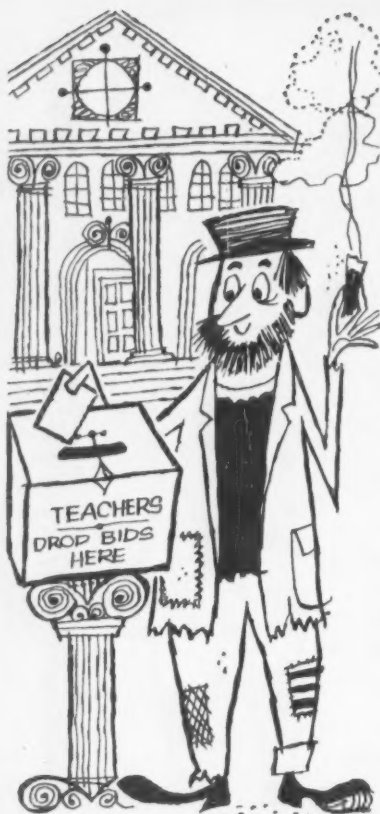
Ask your architect about this dramatic new building material — or write Kalwall for free booklet. Kalwall Corporation, Manchester, New Hampshire.

KALWALL CORPORATION

KALWALL CORPORATION
Dept. NS, 43 Union St.
Manchester, New Hampshire

Please send me booklet entitled,
"Kalwall Translucent Schools".

Name..... Position.....
School.....
Town..... State.....



WHAT IF TEACHERS' SALARIES WERE ON BID?

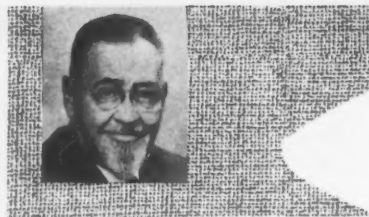
You would surely wonder about the quality of teaching if teachers were required to submit bids for their jobs.

You should wonder about a "bargain" in sporting goods. Don't take chances on cut-price bids and bargains. Buy from a reputable dealer who backs up his sale with integrity, quality and a service guarantee.

Buy from a member of the National Sporting Goods Association... where sports is a business and not a sideline. Buy where you see this sign—



NATIONAL SPORTING GOODS ASSOCIATION
716 N. Rush St. • Chicago 11, Illinois



ON THE SHELF

with James M. Spinning

Swansong of A.A.S.A. Yearbook Does Credit to the Profession

Professional Administrators for America's Schools. 38th Yearbook of the American Association of School Administrators. N.E.A., 1201 16th St., N.W., Washington 6, D.C.

It is fortunate that the A.A.S.A. moratorium on yearbooks did not go into effect before the publication of the 1960 volume — an able discussion and summary of the factors that motivated the association's resolution of February 1959 to limit new membership after January 1, 1964 to those with two years of successful graduate work in approved courses in educational administration. This is a strong appeal for educational leadership to come of age as a profession. It gains added authority from the fact that the chairman of the Yearbook Commission is also the executive secretary of the association's Committee for the Advancement of School Administration.

The first of the 11 chapters details the problems of Riverdale (town real; name disguised) in its selection of a new superintendent. The seventh proposes an ideal but not impossible program of preparation for "expectant administrators," and suggests how it might be financed.

Other chapters discuss the current picture in preparation and inservice training, describing them as too often woefully lacking in staff competency, content and usefulness. The commission argues forcefully throughout the book that in the vortex of changing technology, value systems, exploding population, and expanding responsibilities, no superintendent can afford to fly by the seat of his pants alone. That won't do for a jet job. Influential segments of the public are at last beginning to sense the importance of his work and his need for better training.

"More Than Has Ever Been Known Before." How well is the superintendent prepared now? Does he fit the public stereotype of him? Or his own? The Riverdale board said it was shocked by the number of men holding administrative positions who were poorly educated in the humanities and who were inarticulate in both speaking and writing. But the superintendent hardly matches the picture in which the wilder critics of the

schools make him appear as a bumbling teachers college product with a major in coaching athletic teams, almost totally unacquainted with scholarship virtues.

Deriving its data from the just-ready-for-publication N.E.A. study of the superintendent's career pattern, the commission draws his profile. The conclusions could not be further from the expectations of those who have polled only their taxi drivers and their own imaginations.

The typical superintendent is 51 years old. He came from a small community and a larger than typical family, of which he was probably the first-born. He was graduated from a straight arts college, where he took the hard core subjects, majoring in the behavioral sciences, physical and biological science, history and government, or education. He has had more than five years of graduate work. Only 15 per cent of the 859 included in the study had their bachelor's degree in education; 9 per cent majored in English, 3 per cent in health and physical education, and less than 1 per cent in guidance. Most took the usual route of teacher, principal and superintendent, reaching the first administrative post before they were 35.

These superintendents have held their present jobs an average of nine years. For 54 per cent this is the first superintendency. They are not hedgehoppers, 44 per cent having stayed in one community and 85 per cent in the same state. Their average salary is \$10,700. Few have martyr complexes or talk about their ulcers, if any. **They like their jobs**, and most of them would do it all over again.

How They Rate Their Own Training. Superintendents seem generally satisfied with the quality of their graduate preparation. But, alarmed over the way in which the respondents rated the strengths and weaknesses of that training, the authors are skeptical about the value "of the melange of preparation programs" to which they submitted themselves. They found that there was no rounded core, that for the most part each chose his own curriculum, and that there was a sad dearth of field experience and internship.

Of the most important qualifications

NOW ... SAVE 50% and MORE WITH "MIRAC-O-LITE"®

RE-LIGHT YOUR SCHOOL-ROOMS WITHOUT RE-WIRING!

**Low-Brightness Lamps Give You More Comfortable Light ...
Require No Shielding ... Greatly Reduce Maintenance and Operating Costs
... Are Guaranteed for 3 Years, Normally Last for 10 Years!**

"MIRAC-O-LITE" INITIAL AND ANNUAL SAVINGS

Cutler "Mirac-O-Lite" fixtures may be installed in existing outlets without re-wiring; saving you 50% or more in your relighting projects, or enabling you to re-light twice as many classrooms on the same appropriation. Furthermore, Cutler cold-cathode "Mirac-O-Lite" lamps provide low-brightness light, offering more comfort while eliminating dust-collecting shielding. As a result, you save on maintenance, gain in light efficiency. Lastly, lamps unconditionally guaranteed for 3 years—normally last for 10 years. Why don't you look into "Mirac-O-Lite" at once and see the difference all-ways!



Installation at Lower Moreland, Huntingdon Valley, Pa.

PLANNING NEW SCHOOL BUILDINGS?

Similar savings and operating advantages are also the reasons why more and more school boards are specifying "Mirac-O-Lite" for new school buildings. Even "Mirac-O-Lite's" clutter-free design complements today's new-look in classrooms. Why not request specifications and prices at once!

See This Comfortable Light in Our Booth 1347, AASA Show, Atlantic City, Feb. 13-17.



**CUTLER LIGHT
MANUFACTURING
COMPANY**

® Registered

2024-28 N. 22nd St., Philadelphia 21, Pa. • POplar 5-7683

Vol. 65, No. 2, February 1960

UNSOLICITED TESTIMONIALS FROM A FEW SCHOOL ADMINISTRATORS



"MIRAC-O-LITE" FREE TRIAL

Without obligation on your part, we will be happy to make available "Mirac-O-Lite" fixtures for one of your classrooms. This offer is made because of the success we have had with this "No Obligation Offer Plan" with schools throughout the country; and we are certain that a trial will convince you to choose "Mirac-O-Lite."

Cutler Light Manufacturing Co., Dept. NS260
2024-28 N. 22nd Street, Philadelphia 21, Pa.

- ☐ Please forward "Mirac-O-Lite" data and prices.
- ☐ Also forward details about your One Room Free Trial.
- ☐ Send us name and address of nearest Distributor.

Name _____ Title _____

Address _____

City _____ Zone _____ State _____



For additional information, use postcard facing Cover 3.

IF IT'S ABOUT TIME...

CHECK THE TOTAL COST

- INSTALLATION COST
- OPERATION COST
- MAINTENANCE COST
- REPAIR COST

Initial costs are sometimes deceiving. A Cincinnati master clock system is designed to last as long as the bricks and mortar of a new school building.

Cincinnati wired synchronous and impulse systems offer the utmost in efficient, trouble-free operation, low cost maintenance, and easy program setting.

ENGINEERING • SALES • SERVICE

Cincinnati
TIME RECORDER CO.

1738 Central Avenue
Cincinnati 14, Ohio

Since 1896

Write for "Technical Topics" covering
Time Systems and their operation.

for their work they ranked intelligence seventh! Prime in importance they considered ability to see the whole picture, unusual understanding of people, unusual ability to live with a high-pressure job, and administrative experience in a secondary school. As most important fields for study they listed school finance, curriculum, public and human relations.

Badly in Need of a Complete Overhauling. Surveying both by questionnaire and interview the current preparation scene in the universities and colleges, the commission finds "a rather dismal montage." Of 293 institutions reporting, 251 have programs for intending administrators, but "only a small handful have anything resembling a selection program" centered on administrative potential.

Casing the course offerings, the commission notes with distress none with the title of "human relations" or reasonable facsimile, and no recent revision of courses in response to the need of administrators for wider knowledge in the social sciences. They found too many institutions with small enrollments, 84 per cent of those surveyed having 25 or fewer students. Only 28 of 251 offered internships. "If an institution cannot provide internship training it should not be in the business of preparing educational administrators."

Inservic Resources. Mentioned first as an ever-present help is the professional association, the A.A.S.A. "Good publications," the book says, with special compliments for "Hogs, Ax Handles, and Woodpeckers." The A.A.S.A. also sponsors drive-in conferences, which are undoubtedly of higher potential than has yet been realized. The annual convention is good for stimulation, exposure to new ideas, and a sea-change. But it is not an experience in depth.

State department leadership is strong in some states, but not in all. Hopeful note: In 1947 two-thirds of the chief school officers were politically elected and only eight appointed by state boards, whereas today less than half are elected and 22 are named by the state board.

Superintendents will do well to nurture their own growth by associating themselves with university programs (especially in research) and cooperative study councils. And they can read, too. But do they? According to the Pharis survey of 1958 one-fourth of the group studied had read not one book on education during that year. Almost half had read neither a work of fiction or one of biography.

(Maybe there is an unsuspected market for this yearbook right within the craft. I am working only from page proofs, but I am told that the format will be especially attractive, with fine art work on off-white paper and brown ink. I can guarantee good typography, fresh insight

marked by newly minted phrases, and challenging content. The book has what Arnold Bennett called *stingo*.)

The commission says that the practicing superintendent wants to know where he can get dependable findings in recent educational research, in community decision making, and on how administrative behavior affects achievement of organizational goals. Yet he makes scant use of leading research journals. Some of the cant terminology bothers him. He readily comprehends "line and staff," "vertical and horizontal organization," and "social mobility." He is not so sure of "charismatic leadership" (though he may practice it) or the "Hawthorne effect." Whether he understands Parkinson's Law is not stated.

But the fellows who wrote this book and know all about the relation of nomothetic considerations to alter-group expectations have the great grace to add kind words for the "human, intuitive, unlettered dimensions of school leadership that no amount of contrived inservice work can convey." Thus:

"The hunches, the trials and errors, the creative, inspired solutions to problems, the actions prompted by the spirit as much as by fact, unaccompanied by scientific management, unguided by social scientists, have produced a sweepingly successful product. Let us not lose our gift for seat-of-the-pants judgment while we are waiting for research answers to our problems.

"For all of the group dynamics involving the participation of many teachers and laymen, for all of the promised de-

A.A.S.A. 1960 Yearbook Commission

On the Yearbook Commission are:

Hollis A. Moore Jr., executive secretary, A.A.S.A. Committee for the Advancement of School Administration and 1960 yearbook chairman; Melvin W. Barnes,



superintendent of Hollis A. Moore Jr. schools, Oklahoma City, Okla.; John I. Goodlad, director, Center for Teacher Education, University of Chicago; Daniel E. Griffiths, associate professor of education, Teachers College, Columbia University; Warren G. Hill, state commissioner of education, Maine; Sidney P. Marland Jr., superintendent of schools, Winnetka, Ill.; Kenneth E. McIntyre, professor of educational administration, University of Texas; Paul J. Misner, superintendent of schools, Glencoe, Ill.; Lawrence E. Toddhunter, assistant superintendent of schools, Fresno, Calif.



They love to drink milk the "pushbutton" way!

They insert a coin, push the button and help themselves to delicious cold milk whenever they want it — that's why children drink more milk

at school when it's served through a Vendo Milk Vender. It's fun and it's easy for them . . . easy, too, on busy school personnel. These machines refrigerate, serve, collect and make change for you automatically!

VENDO MILK VENDERS can be installed easily in any location you choose. They serve milk in individual sanitary cartons at prices ranging from 1¢ up. For detailed information on how Vendo equipment can help the milk program in your school, call your milk supplier or write us today.

THE Vendo COMPANY

7400 EAST 12th STREET • KANSAS CITY 26, MISSOURI

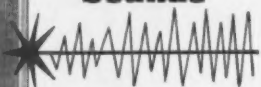
WORLD'S LARGEST MANUFACTURER OF AUTOMATIC MERCHANDISING EQUIPMENT





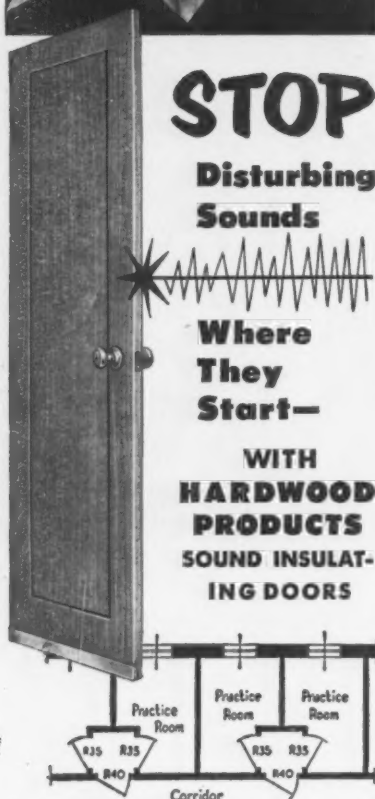
STOP

**Disturbing
Sounds**



**Where
They
Start—**

**WITH
HARDWOOD
PRODUCTS
SOUND INSULAT-
ING DOORS**



Isolate disturbing noise and sound in music and band rooms, gymnasiums, workshops and hallways with this nationally famous sound insulating door. Pre-measured for sound reduction, you know in advance the final noise factor. Sound Insulating Doors come in 35, 40 and 43 decibel degrees of transmission loss — controlling a full range of sound intensity. Write for details or consult your architect or acoustical engineer.



Get this FREE brochure

It tells in understandable non-technical language how SOUND INSULATING DOORS function — how sound intensity is measured and controlled.

WRITE BOX NS

HARDWOOD PRODUCTS CORPORATION

NEENAH • WISCONSIN

NEW YORK • CHICAGO • BOSTON • CLEVELAND

vices of social science, for all of the expert help at hand, the burden of the lonesome hours of decision making is the superintendent's own. In other words, his final resources are, yes, his intuition, his common sense, his heart and the things he has learned about education through disciplined study."

Picking the Horses. Now from what is to what should be. Let's look in our own backyards for promising administrative material. Begin in the secondary school. Set teacher organizations to scouting for leaders. Get school administration into career days. Follow up your preferred risks through college and into their first teaching positions. Study your faculties and groom the best candidates even if you lose your own jobs to them.

Colleges should screen applicants. "There are too many dubious contenders." Screen for intelligence? Yes, but "to be truthful, about all that is known about the intelligence of leaders is that they are usually a bit brighter than their average followers, and probably should be." But at least the "language lacerators" and extreme deviants can be sieved out. Screen by college grades? "Unfortunately, research has not discovered a high correlation between grades and success at anything except making more grades in similar courses."

Now it strikes me that in being so fair about the value of various criteria the commission has neglected some good positive leads. If I were a college professor or a superintendent or a school board member, I think I'd emphasize this line: How much *initiative* has this chap shown in whatever job he has held — as student or as pfc., or as department store employe, and in his voluntary associations as one man among others? First-born or not, did he carry a paper route, work with a road gang, tackle the hard things, and stand the gaff? Has he shared in family financial responsibilities? How prompt has he been to help others? Who are his friends, and how loyal is he to them, they to him? And, of course, can he speak the language with clarity and sometimes with vigor?

The book says: "Effective educational leadership is not a blessing that droppeth as the gentle rain from heaven upon all those who do not know enough to come in out of it." I don't know where it comes from. But I think it inheres in those who have an urge to get good things done and who can learn in time how to get others to go along in helping to bring things to pass.

How To Run the Good Course. The model program laid out for a mythical State University asks for candidates discriminatingly chosen, two years of graduate study, a faculty strong in scholarship and the practice of educational administration.

The program is phased into an admission core (a whole summer or half a semester) of measuring, assessing, counseling, providing experience in studying the major areas of administrative authority, learning group processes, locating research materials, developing a philosophy of administration. This is all part of continuous screening.

The second phase deals with advanced studies, including a general survey and work in cognate fields and then focusing on a specialized area of administration. There are some lectures, much discussion, great insistence on critical thinking, use of the case method, decision making in simulated situations, role playing, field trips, and surveys. It includes a practical approach to budget making and presentation, formulation of objectives, curriculum building, evaluating and improving instruction, community study — all with heavy emphasis on developing sound educational theory and applying it.

The third phase is on-the-job training — internship and internship seminars. Hooray for State! This is a core. No room for Arthur Murray. But I think I'd add a lively course in art, music and literature, as well as an intensive review of the decencies of English composition.

Paying the Shot. The sort of preservice training the commission advocates costs money. So does the inservice work to which a full chapter is devoted. Where find the funds? First consider the Boortz study. We have been spending on educational administration only a fraction of what other professions spend. The institutional cost for our three-year programs has been only a sixth of that for medical preparation, one-third of that for dentistry, one-half of that for law. And in these other cases the training is just for the practice of the basic profession, not for professional leadership in it. Much of it is heavily subsidized, too. The data gathered for the yearbook show that three-fourths of the superintendents doing graduate work receive no scholarship aid at all. Only 1.2 per cent received more than \$5000 from sources outside themselves.

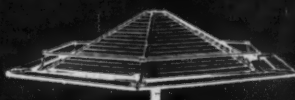
To meet the costs of proper training there should be assistance to the preparing institution as well as to the individuals. Whence? Public education gets the ultimate benefit. The commission suggests that school systems should be willing to contribute 1 per cent of their annual budgets. "You don't know Nellie like I do," said the saucy little bird on Nellie's hat." But the commission can point to significant beginnings in such financing.

One important step is to cut down the number of institutions attempting the job. The move should be toward regional concentration in universities selected

(Continued on Page 158)



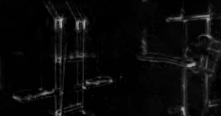
"my grandfather makes the best playground equipment in the whole world because he loves little people like me! he makes slides and swings and see-saws and all kinds of things. they're real strong and they're very safe. if you're going to buy playground things you better talk to my grandfather first. his name is mr. burke."



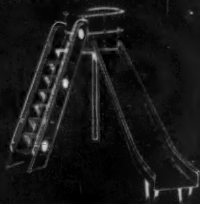
Extra Heavy Duty Merry-Go-Round—4½" o.d. galvanized steel pipe support plus finest select hardwood make this a life-time service unit.



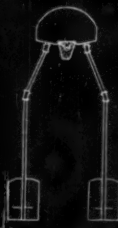
Rugged Heavy Duty Swing—triangular end pipes plus center pipe supports.



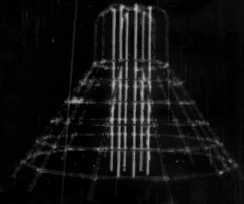
Kiddie Glider and Hobby Horse Swing—self-propelled with maximum safety. Can be assembled with various swing units.



Unique Space Saver Slide—Features bright weather-proof colors over galvanized iron and a stainless steel bedway.



Regulation Offset Basketball Backstop—Safest design in outdoor backstops. Support pipes set back 2½' from play area, 6' apart.



Climb-A-Round—diversified play for 25 to 85 children, depending on size of unit.

Mail Request To:

J. E. BURKE COMPANY

P. O. Box 986 Dept. 126 New Brunswick, New Jersey

OR

P. O. Box 549 Dept. 126 Fond du Lac, Wisconsin

At No Cost Please send me your complete playground planning and specification file.

Name: _____

Street: _____

City: _____ State: _____

No Smoking Areas for Students!

'Unlawful, Unhealthful, Immoral'

A SUPERINTENDENT from Missouri submitted this month's opinion poll question to a class in public relations composed of teachers and administrators. He reports that 85 per cent of the class members are against high schools' setting up regulations for smoking or providing smoking areas. And 87 per cent of the superintendents participating in The NATION'S SCHOOLS February opinion poll are in agreement.

State laws dictated the choice of some schoolmen. "It is illegal in Michigan for those under 21 to smoke cigarettes anywhere except under the jurisdiction of their parents and on home property," said one official. Another stated: "It is a violation of the Pennsylvania Penal Code to sell cigarettes to minors."

"In spite of the fact that many students do smoke, I believe that we as teachers would be defeating the principles laid down by the state department of education if we provided areas for smoking. We are asked to teach our students the ill effects of tobacco, alcohol and narcotics," an administrator from Minnesota commented.

Contradicts Health Habits

Many respondents asserted that providing "smokers" for high school students would be contradictory to the teaching of good health habits. "If smoking is harmful, as medical authorities seem to agree that it is, we should not make it easier for our youth to acquire the detrimental habit," a Kansas schoolman remarked. A New Jersey respondent stated flatly that "the schools should not contribute to a potential health hazard."

Another group of superintendents contends that providing areas for high school students to smoke would encourage smoking. This, they believe, should not be done. "Many youngsters who would not otherwise learn to smoke may do so where conditions are such that smoking is convenient," said a Kansan. A New Jersey administrator declared: "Schools should provide opportunities for wholesome attitudes

and habits, and not encourage such poor habits as smoking."

An administrator from Pennsylvania supplemented his vote with the maxim: "Give them an inch and they take a mile."

"Using the premise that because students smoke, we should provide a place to smoke, we might also set aside an area for any activity desired by the students," stated a respondent from Illinois.

"Teen-agers also drink, get into fights, drive recklessly, and have illicit sex relations — but I doubt if any school is considering a supervised area for such activity," said an Iowa superintendent, who, among others, attached a moral implication to the question.

It's a Question of Morals

"If we condone one type of immorality and provide the means for it to be carried on, then we should provide for them all alike," added a Texan.

Some schoolmen believe restricting smoking by high school students to be a way of teaching self-discipline. A Californian stated: "Assisting young people to develop proper self-control, including restricting smoking on school grounds, is a perfectly legitimate responsibility of the secondary school."

A few comments against smoking on school grounds contained a fire hazard argument. This one was by a Vermont superintendent: "I believe that there should be no provisions for smoking in any schools — by either

faculty or students. There are enough fire hazards without adding this one."

A statement by a Colorado schoolman presented words familiar to educators: "I thought the nation was pressed for classrooms. Therefore, we need a special room for smoking?"

Thirteen per cent of the respondents would have high schools provide smoking areas and set up regulations. The following suggestions were made.

With Parents' Consent

"Designate a small outside area where students who have secured written parental consent may smoke when the regular school classes are not in session. This area should be located so that no fire hazards are created or where pupils do not normally gather." (N. H.)

"Provide supervised smoking areas with a register of all students who visit the smoker." (Tex.)

Permit students who have "written parental consent" to smoke. "Send a list of rules and regulations to the parents. Have two designated times daily in a secluded location under faculty supervision." (S.C.)

"Allow smoking at social events in the evening only." (N.Y.)

"Make smoking areas off-limits to nonsmokers." (Ark.)

An Oklahoma administrator believes that "a designated area would greatly reduce the number of students who slip out and smoke at the corner of the school grounds or in some secluded spot.

"Frankly, I think it would help discipline," he said.

"There isn't a high school principal anywhere who can effectively enforce no-smoking regulations," challenged an administrator from Massachusetts. "The United States failed to stop drinking by prohibition." ■

Opinion Poll Findings

Should high schools recognize that teen-agers do smoke by setting up regulations and providing smoking areas?

Yes . . 13%

No . . 87%

Based on a 4 per cent proportional sampling of all school administrators in continental United States, this survey brought a 60 per cent response.



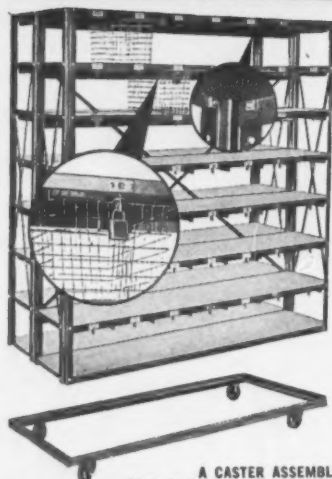
known fact: Any bucket of cleaner starts losing its power as soon as you put a dirty mop or sponge in it! . . . but now . . .



Announcing! the cleaner that gives you a full bucket's worth of cleaning power every time! **Johnson's FORWARD** . . . never suffers power fade-out. Even when it's loaded with dirt, you know its cleaning action isn't giving out! **Now**, try **FORWARD** and see what it means to get all the cleaning power you pay for! **Call** your local Johnson's Wax Distributor . . . or write S. C. Johnson & Son, Inc., Service Products Division NS2, Racine, Wisconsin.

New Johnson's Forward a product of **JOHNSON'S WAX** service products division

Any Size GYMNASIUM BASKET RACKS WITH RECESSED HASPS



A CASTER ASSEMBLY
Made to fit any single or double rack, may be added, or removed at any time.

Insist on Neubauer Basket Racks for these exclusive features:

1. Rigid twin-post corners make the whole rack stronger,
2. Your choice of any size to fit odd baskets or limited space,
3. Easier assembly, hasps and dividers installed at the factory,
4. Recessed hasps can't snag clothing or cause injury, (Hasps omitted if desired) plus a choice of four popular baked enamel finishes, plated hardware, sturdy bracing, and other details of quality.

**STORAGE
SHELVING**
with patented
twin-post corners



**AND
LIBRARY
SHELVING**

with beautifully finished end panels, can be furnished in any size to fit your room dimensions. Baked enamel colors are green, grey, tan and beige.

***No extra charge**

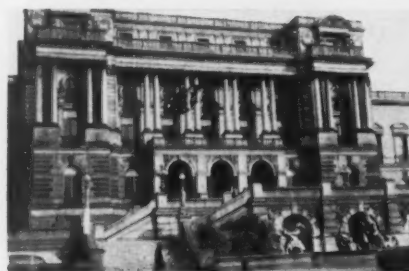
You don't pay a premium for odd sizes when you buy Neubauer racks and shelving.

TWIN POST
Neubauer
MANUFACTURING CO.
517 LOWRY AVENUE N.E.
MINNEAPOLIS 18, MINN.

Report

from WASHINGTON

By EDGAR FULLER



Entrance to the Library of Congress

EDUCATION may be hottest domestic issue in 1960. Nixon, if elected, may reexamine Ike's educational policies. Flemming appeals to the practitioners of higher education.

Nelson A. Rockefeller's withdrawal from the race for the Republican presidential nomination left most Washington educators unmoved. They recall that he promoted the ill-fated Hobby school construction bill and similar legislation as Undersecretary of the Department of Health, Education and Welfare. In this role, he was regarded as peculiarly insensitive to federal red tape in education, and too willing to substitute bureaucratic activity for funds that would substantially assist the schools. Many doubt that his good educational record in New York would carry over to the national level.

Vice President Nixon's position on education will be affected to some extent by the Administration's record. It will depend much more on attitudes of the leaders of organized business and commercial agriculture, who are his principal financial and political supporters. He is in the exceptional position of being able to ensure that the Republican platform shall reflect his own estimates of what is politically sound, provided he has no competition for the Republican nomination.

Mr. Nixon has many friends among educators in Washington and throughout the country. He has made a number of excellent speeches on educational problems, and there is a belief that, if elected, he would reexamine some of the educational policies of his predecessor. There is even some hope that he might liberalize federal support to attain the quality education that Americans demand.

H.E.W. Secretary Arthur S. Flemming, widely regarded as a Republican candidate for the vice presidential nomination, believes that the federal government

should play a greater part in higher education. He recently encouraged colleges and universities to get into politics to achieve this end, with a comment that the future of higher education depends upon such political action. The Secretary appeals more to practitioners in higher education than to those interested primarily in elementary and secondary schools. Both as a spokesman for current policy of the Administration and as a potential candidate, Secretary Flemming is a significant part of the Republican posture for 1960.

The Democratic advisory council announced last December that financial assistance from the federal government has become an "imperative" for education. It proposed federal assistance for local school needs with emphasis on construction, along with college scholarships and loans, college facilities, adult education, vocational retraining, and research in educational methods. All this was approved by Democratic presidential possibilities Brown, Humphrey, Kennedy, Meyner, Stevenson, Symington and Williams. The two dissenting votes in the advisory council came from Governor Collins of Florida and National Committeewoman Everett of North Carolina.

Education is widely regarded as a major domestic issue for 1960. It may become such if the respective positions of the parties and candidates can be made clear to the voters by next November.

Party platforms are usually talked about, compromised and then largely ignored. With few exceptions, campaign oratory tends to be double talk, with assurances to supporters of all sides of such thorny and complex issues as education. However, it should be possible in 1960 to ascertain more definitely than in previous election years what the parties and candidates propose for education, because more voters than ever before desire to know and to vote accordingly.

(Continued on Page 36)



PROTECT STUDENTS FROM FALLS WITH **SLIP-RESISTANT** BRISTOLITE WAX



It happens, even in the best of schools. Late arrivals make corridors look like the scene of a track meet. That's why Bristolite Floor Wax is becoming popular with more and more maintenance men.


Bristolite wax is designed to beautifully maintain a floor for long periods, even under difficult use conditions. It is an all-purpose wax formulated with three

primary qualities in mind: it must be slip-resistant for safety, remain glossy under heavy traffic, and dry without water marks for ease of maintenance and long protective life. Bristolite has a tough surface which requires less buffing, mopping and stripping.

See our representative, the Man Behind the Huntington Drum, for full details.



Where research leads to better products... **HUNTINGTON**

HUNTINGTON  **LABORATORIES** • HUNTINGTON, INDIANA • Philadelphia 35, Pennsylvania • In Canada: Toronto 2, Ontario

SOUTHSIDE SCHOOLS, INC. offers free school to Negroes in Virginia. State payment of scholarships presents serious threat to public schools.

A new organization called Southside Schools, Inc. has been chartered to operate tuition free private schools for Negroes in Prince Edward County, Virginia. Organized by 10 white citizens, several of whom are also members of the Prince Edward School Foundation that is operating schools for all-white children in the county, the corporation has announced that it will offer courses similar to those offered by the Foundation. The N.A.A.C.P. is advising Negroes not to attend the classes.

When the public schools were padlocked, the Prince Edward County Board of Supervisors cut the county tax rate 53 per cent, and asked taxpayers to contribute the amount of the reduction to the Foundation. More than \$300,000 has been raised for the current year, but such voluntary support is not expected to be adequate on a permanent basis. The Foundation has not accepted state financial aid in any form, nor has it used any public school property. The 1450 white pupils are taught by former public school teachers who are paid entirely from private funds, and instruction is in churches, homes and other makeshift facilities.

Southside Schools, Inc. provides a convenient way to discover the legal boundaries within which state scholarship funds or public school property can be used for the direct or indirect support of private schools. Operating segregated schools for Negroes, the corporation will probably rent public school buildings and apply to the state for scholarships already provided by law for pupils who desire to attend nonsectarian private schools. These scholarships provide for state payment of such private school costs up to \$250 per pupil per year.

In poor counties such as Prince Edward the state pays most of the scholarship costs. In wealthier counties, however, the counties bear a major share of the cost. The entire arrangement is subject to abuses. Most of the state scholarships being used in several northern Virginia counties, for instance, have gone to pupils who would have attended private schools anyway; less than 40 per cent in one of these counties attended public schools during the preceding year. Ironically, although the scholarships were authorized primarily to enable pupils to escape integrated schools, some of the recipients have left segregated public schools to enter private schools that are integrated.

For public schools the situation is serious. The scholarship costs that must be paid by the counties tend to be regarded

as a charge on the public school budget by the county officials who control school expenditures, and even by school boards themselves.

If a cooperative Virginia legislature experiments through Southside Schools, Inc. to give the broadest possible legal scope to scholarships, threats to public education itself may develop in some communities. Such use of scholarships could undermine the public school and its budget by encouraging the establishment of small private schools without criteria other than that sectarian motives must not be legally visible.

FEDERAL commitment to science education unmistakable, but curriculum not developing fast enough.


The extent to which the federal government is financing research and teaching in science, mathematics and technology is growing rapidly. For at least a decade, Congress and successive administrations have regarded the advancement of these areas as essential both to the national defense and to the domestic welfare.

Since sputnik, the question has not been congressional support, but rather what schools and colleges will accomplish because of the increased resources available. We believe that the impacts of the new programs on elementary and secondary schools are vastly underestimated by school boards, teachers and administrators, and that as a result they are missing opportunities to guide the new programs along educationally desirable lines.

The new impacts are dismaying to some elementary and secondary school leaders who believe in a "balanced" program and who rely on traditional local and state activity for program improvement. In their resentment they define "balanced" in a way that implies that there should be less emphasis on science. They tend to brush off suggestions from new sources, although they are the teachers and administrators who should be directing the science and mathematics emphasis that Congress has decreed into channels that are educationally sound.

All school people, we believe, should take a hard look at the tempo of curricular change. This applies to the content of individual subjects as well as to the proportion of instructional time to be divided among the various fields. Is the speed of traditional curriculum development in the schools adequate to meet the realities of modern times? Congress doesn't think so, and the Administration agrees. The scientists and mathematicians do not think so. The general public, if Congress represents it authentically, does not think so either. Many educators agree, and ask: "Just what is a balanced curriculum in 1960?" ■

LOOKING BEYOND THE BLUEPRINT



Science Room Furniture and Equipment by

DURALAB

The DURALAB Engineering Dept. really goes to work after your rough blueprints are received. The following services are made available to you at no additional cost. Preliminary Layouts, Specifications, Budgetary Estimates, Firm Estimates, Detailed Plans, Controlled Manufacturing Procedures, On-Time Deliveries, Precision Installations—this is the proven procedure that guarantees a completed Science Room—that will serve efficiently, economically and provide an atmosphere conducive to learning.

Avail yourself of dependable service. A phone call or letter to our home office will bring you a factory trained representative at no obligation on your part. Planning Guide and Catalog DE-4 with complete specifications, illustrations and roughing-in drawings, available for the asking.

You can prevent many colds with Antiseptic HUNTOLENE. !

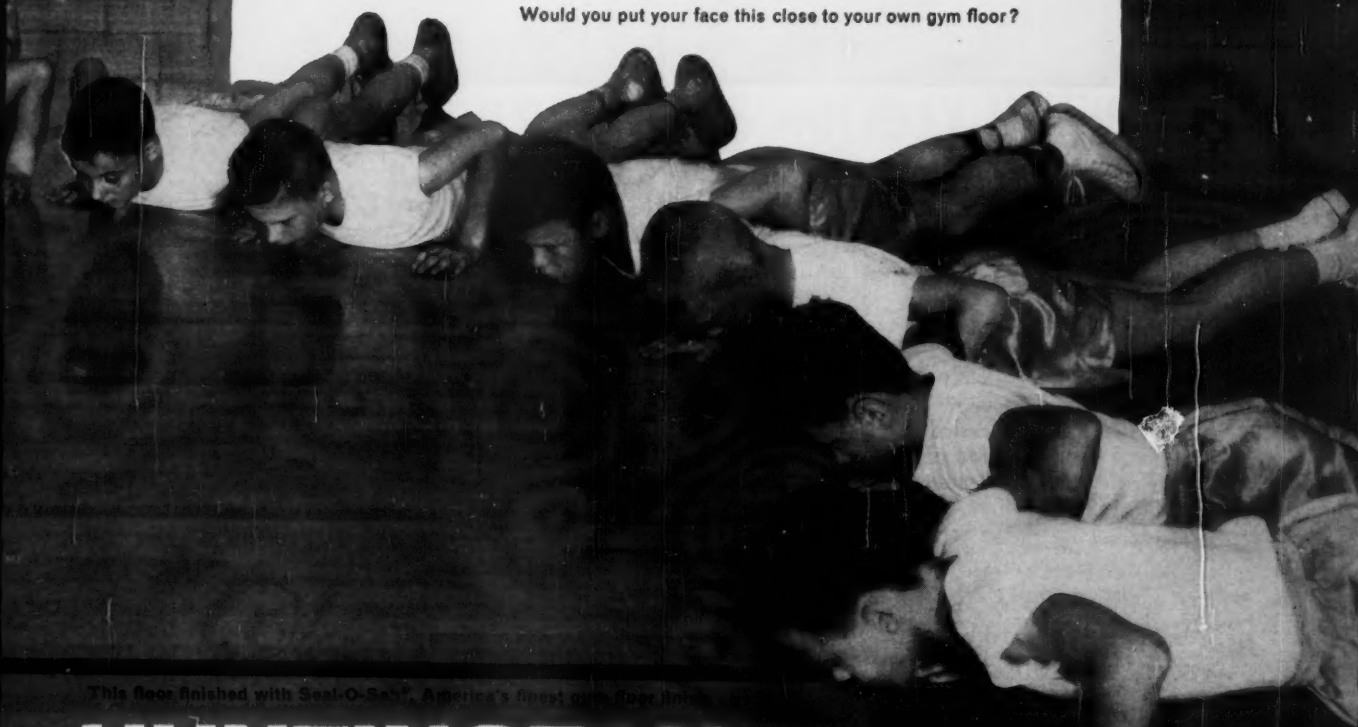
Floors are germ traps. Disease bacteria are constantly settling to the floor where they multiply rapidly, *unless inhibited*. You can do much to reduce this health hazard with the dust mops now used to "clean" your floors, simply by spraying Huntolene Antiseptic Dust Control on the mopheads. Huntolene inhibits germ growth, slows or stops their multiplication, even protects the maintenance man by killing bacteria in the mop.

Tests in our files conclusively prove these benefits. Ask your Huntington representative about this unusual, low cost product which does so much to protect health. *Huntington Laboratories, Huntington, Indiana, Philadelphia 35, In Canada: Toronto 2.*



Huntolene Antiseptic Dust Control has been rated for safety by Underwriters' Laboratories regarding flammability.

Would you put your face this close to your own gym floor?



This floor finished with Seal-O-Seal, America's finest gym floor finish.

HUNTINGTON

... where research leads to better products



BEGINNERS "THRIVE" ON THE *SLANT-O-MATIC*

The SLANT-O-MATIC* is so simple to operate! Anybody who can read "O" and "B" can do overcasting right off. Or dial "A" and "L" and make real button-holes after just a few tries.

What a confidence-builder!

There's teacher confidence built into it, too. SINGER engineers designed it for simplicity and ruggedness. They gave it more punishment during rigorous testing than a machine will ever get in your classroom.

In actual use, the SLANT-O-MATIC is proving to

be every bit as dependable and long-suffering as the straight-stitching SINGER* machines.

Another important point. No other zigzag sewing machine can promise more mileage in the classroom than the American-made SLANT-O-MATIC. The zigzag mechanism completely disengages for straight stitching to give long wear and perfect straight stitch.

Every one of *your* students should have experience on the SLANT-O-MATIC... the machine that makes "complicated" sewing easy... even for beginners!

- SPECIAL PRICES TO SCHOOLS
- SPACE-SAVING DESK CABINETS
- TEACHER'S DISCOUNT



SINGER SEWING CENTERS

Listed in your phone book under SINGER SEWING MACHINE CO.
*A Trademark of THE SINGER MANUFACTURING CO.



Viewlex
PUTS *You* IN THIS PICTURE

WIN A FABULOUS FREE HOLIDAY IN EUROPE VIA **TWA** INTERCONTINENTAL **BOEING 707 JET**

It's simple — just tell us in as many words as you wish "How Audio-Visual Aids Make Teaching and Learning Easier". Your own everyday teaching experiences with your VIEWLEX Projectors and other A-V Equipment could put you and a member of your family in the "Vacation Picture" you've always dreamed of! It begins the thrilling moment you board a fabulous TWA Intercontinental Boeing 707 JET, the world's fastest, largest non-stop jetliner flying from America to Europe. You're literally whisked — in less time than it takes to think about it — to "Gay Paree" where you step out right into the heart of Europe's vacation wonderland.

PLUS More than 50 additional awards including: An all-expense-paid trip to the 1961 DAVI Convention in

**WRITE FOR FREE ENTRY BLANK —
 REQUIRES NO PURCHASES OR OBLIGATION**

Miami for the 1st Prize Winner's A-V Director, U.S. Savings Bonds for 2nd and 3rd prizes, Viewlex Projectors given in the name of major prize winners to their schools, and free DAVI memberships and A-V Instructor subscriptions to all Honorable Mention Winners.



Viewlex Company, Inc.

35-01 Queens Boulevard, Long Island City 1, New York

Please send full details on Viewlex Audio Visual Teaching Award and official entry blank.

NAME _____

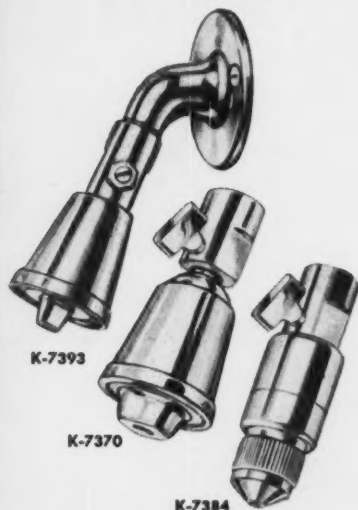
ADDRESS _____

CITY _____

ZONE _____ STATE _____



Shower heads with volume control
 • Spray patterns provide full body coverage for thorough cleansing
 • Tamper-proof—cannot be detached without tools • Engineered for long trouble-free service.

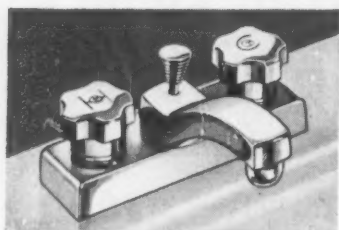


K-7393. Flanged shower arm with rigid head—no ball joint. Volume regulated by screwdriver. Sturdy, economical.

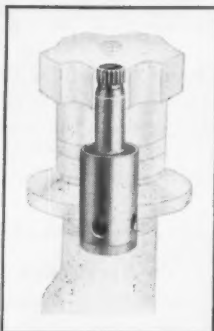
K-7370. Non-clogging, long-wearing nylon face. Ball joint with tension spring. Drains, cleans easily when face nut is turned.

K-7384. Economical, water-conserving, compact. Knurled nozzle turns for desired spray and force. Ball joint with tension spring.

For rugged school service . . . specify **KOHLER plumbing fittings**



Centra lavatory fitting, K-7400
 Distinguished Constellation design matches Kohler fixtures in style, quality. Responds to finger pressure, with positive action. Maintains constant flow at volume desired. The Kohler line includes a slow self-closing fitting.



Interchangeable valve unit (Right)
 Non-rotating movement presses the seat washer against a stationary seat—eliminates the wearing action of conventional screw-type valves. Easily replaced, if necessary, and used in all Kohler fittings.

Only first quality fittings will pass the strenuous test of school use. Kohler fittings are all brass—the metal that insures greatest resistance to wear and corrosion and holds chrome-plating best. They meet the requirements of school administrators and architects for staunch reliability, economical maintenance, practical modern design.

KOHLER CO. Established 1873 KOHLER, WIS.

KOHLER OF KOHLER

ENAMELED IRON AND VITREOUS CHINA PLUMBING FIXTURES • BRASS FITTINGS
 ELECTRIC PLANTS • AIR-COOLED ENGINES • PRECISION CONTROLS

the experts have their say!



American Desk...design rated straight "A"!



QUADRALINE
by American Desk

Style conscious... and built to last! The neat lines of *square* tubing in rugged, integral units with outstanding grouping possibilities. More leg freedom. Easy maintenance. Large work areas. Fibre-glass seats and backs available.

illustrated front-to-back: *Series 900 Combo Chair and Desk; Series 600 Chair Desk; Series 700 Tablet Arm Chair; Series 700-P Pedestal Tablet Arm Chair.*

AMERICAN DESK MANUFACTURING CO., TEMPLE, TEXAS

American Desk...performance rated "scholarship"!



QUADRALINE
by American Desk

Opinion unanimous on the leadership qualities of the Series 500 Chairs. Comfort-designed to flex and settle with weight distribution... rigidly constructed with molded plywood back, body-contour seat. Tamper-proof tilting mechanism allows 8° automatic back adjustment. In graduated heights, 11" to 18". Fibre-glass or upholstered seat and back available. illustrated front-to-back: *Series 500-W Chair; Series 500-U Upholstered Chair; Series 500-F Chair; Series 810-U Caster Chair.*

AMERICAN DESK MANUFACTURING CO., TEMPLE, TEXAS

American Desk...tested and approved on all counts!



REGULINE

by American Desk

Voted best all 'round from kindergarten through college. Built for years of hard use, American Desk Crusader Chairs have 14-gauge die-formed steel frames. Graduated heights — 12" thru 17".

illustrated front-to-back: *The Crusader Series 300 Chair Desk; Series 335-TA Tablet Arm Chair; Series 303 Tablet Arm Chair; Series 33 Crusader Chair.*

Ask your nearby AD representative to arrange an "on-the-job" demonstration in your school. No obligation.

AMERICAN DESK MFG. CO., TEMPLE, TEXAS

We'd like more details on American Desk School Furniture.

Please send ☐ Complete Quadraline Brochure
☐ Complete Reguline Brochure
☐ Have Representative Call

Name: _____

School: _____

City: _____ Zone _____ State _____



**This one shines
where the traffic's
heaviest**

SIMONIZ Heavy-Duty FLOOR WAX

Guaranteed unexcelled performance. Pure wax base takes the toughest pounding and traffic conditions—comes back for more. Outstanding in all the characteristics you want in a self-polishing, buffable wax for all floors. Acclaimed by increasing thousands who demand professional quality, sensibly priced. Try it yourself.

Available in 1-, 5-, 30- and 55-gallon sizes. Order from your Simoniz Commercial Products Distributor or mail the coupon today!

SIMONIZ®

FOR LONG WEAR—LESS CARE

Heavy-Duty Floor Wax • Non-Scuff Floor Finish • Super Anti-Slip Floor Finish • Triple "A" Paste Floor Wax • Heavy-Duty Vinyl Sponge • All-Purpose Concentrate Floor Cleaner • HiLite Furniture Polish



Simoniz Company (Commercial Products Division—NS-2)

2100 Indiana Avenue, Chicago 16, Illinois

☐ Without obligation, please send details on Simoniz Heavy-Duty Floor Wax.

☐ Please send name of nearest Simoniz Distributor.

Name

Firm Name

Street Address

City State

Research Model ECBI



Elgeet

of Rochester

is *FIRST* to bring you

PROFESSIONAL PERFORMANCE

in a Student-Teaching Microscope

for only \$110.50

\$99.45 in lots of five or more

Elgeet-OLYMPUS

Student-Teaching Model S-2

Now, many of the advanced features of famous Elgeet-Olympus Research Microscopes have been incorporated in the new Elgeet-Olympus line of Student-Teaching Microscopes, extending to educators for the first time a number of important instructional advantages.

In addition to its optical and mechanical superiority, you will note the exceptionally solid "heft" of your Elgeet-Olympus Student-Teaching Microscope . . . ruggedly

engineered of "classroom-proof" materials to withstand daily use by untrained hands. Minimum maintenance is further assured by such refinements as completely enclosed rack-and-pinion movements, and a dust-proof, self-centering revolving nosepiece.

Prove to yourself with a 10-day Free Trial that Elgeet-Olympus Student-Teaching Microscopes provide the logical answer to educators who seek the best . . . on a budget.

IMMEDIATE DELIVERY • WRITE Dept. SM-7

Elgeet OPTICAL CO., INC. . . . SCIENTIFIC INSTRUMENT AND APPARATUS DIVISION

838 SMITH STREET • ROCHESTER 6, NEW YORK

"Quality is our watchword . . . Precision Engineering our constant goal"



Now, for the first time . . .

the color is in the glass!

Now Owens-Illinois adds a new horizon to traditional glass block economy and light control . . . permanent, cool-green color.

New SHADE GREEN Glass Block provide a more comfortable environment for learning with cool, screened sunlight control.

Use No. 80-G SHADE GREEN prismatic block for non-direct sun exposures.


Use No. 80-GF SHADE GREEN prismatic block with fiberglass insert for direct sun exposures.

School exteriors are more attractive, classroom interiors more pleasant with Owens-Illinois SHADE GREEN glass block.

And Shade Green block incorporate all of the economies in heating, lighting and maintenance that characterize standard Owens-Illinois Glass Block.

Want to know more about SHADE GREEN for your school? Write: Kimble Glass Company, subsidiary of Owens-Illinois, Toledo 1, Ohio for more information.



OWENS-ILLINOIS GLASS BLOCK
AN  PRODUCT

OWENS-ILLINOIS
GENERAL OFFICES • TOLEDO 1, OHIO

The Second Goal of School Feeding

Are we spending thousands of dollars of the taxpayers' money on specialized equipment only to provide a catering service?

JAMES S. McALLISTER

Coordinator of Business Affairs, Rochester Board of Education, Rochester, N.Y.

EVERY activity scheduled during the school day is a learning experience. We are wrong — absolutely wrong — to assume that the learning process takes place only in the classroom. Many opportunities are wasted because administrators and teachers do not take advantage of opportunities for learning outside of the classroom. The time the pupil spends in the lunchroom is probably the most neglected period of all.

Why should a business manager speak on such a subject? What does he know about the school curriculum? Let me answer in this way:

An administrator in charge of business affairs is concerned with two facets of public school administration: (1) provision of funds to ensure an adequate educational program, and (2) the efficient and economical use of those funds.

The team in the finance office, like the team in the lunchroom, is a service group. Our mutual task, along with the educational administrators and the teachers, is the education of children. Our greatest service is rendered to the taxpayers, to the children, and to ourselves when we are assured that the expensive equipment required to provide this service is used to its optimum for educational purposes.

Hundred of thousands of dollars worth of specialized equipment, purchased primarily with taxpayers' money, is being used only to feed children and faculty — to provide a catering service, as it were. If this is its only purpose, school tax money is not being used efficiently and economically. More than a half-billion students are fed annually in school lunch departments in this country at an expenditure of approximately \$800 million.

A food service program is never coordinated with the school curriculum unless and until the school district administration has actively participated in this co-

ordination. How do we obtain this administration support?

The bureau of field financial services of the New York State Education Department has set forth certain guiding principles encompassing the successful operation of school food service as an integral segment of the educational program. I shall discuss six of these principles in some detail:

Principle of Integration. The school lunch program is a part of the total school program and the community nutrition program. This means that the food service program should be incorporated as a part of the regular school budget. The superintendent or supervising principal has the responsibility for the school lunch program for the entire district, and the principal shares commensurate responsibility in the school.

The school lunch manager should be a member of the educational team, and school lunch problems deserve the attention of the principal and faculty to a degree equal to other major school functions and curriculum problems. Local curriculum guides should contain statements of objectives and suggested teaching experiences related to the school lunch program. The educational aspects of a school lunch program must be developed by teachers in the classroom and practiced in a supervised school lunchroom.

Many opportunities exist for coordinating the school lunch program and the curriculum. Homemaking immediately leaps to mind — in the area of menu planning, food preparation, and nutritional studies. The practical aspects of health education can be illustrated in no better place than in that educational laboratory called the cafeteria. School lunch is a means of improving the food and nutritional habits of children. The science curriculum, both elementary and secondary, could make good use of the educational facilities in the lunchroom.

Other curricular areas — art, business education, social studies, and others — could easily be coordinated with the school lunch program to their mutual advantage. Posters and charts can explain the balanced diet, the number and proportion of students participating, the cost of school lunch and sources of revenue, the amount and value of various community products used, and comparison with other similar services.

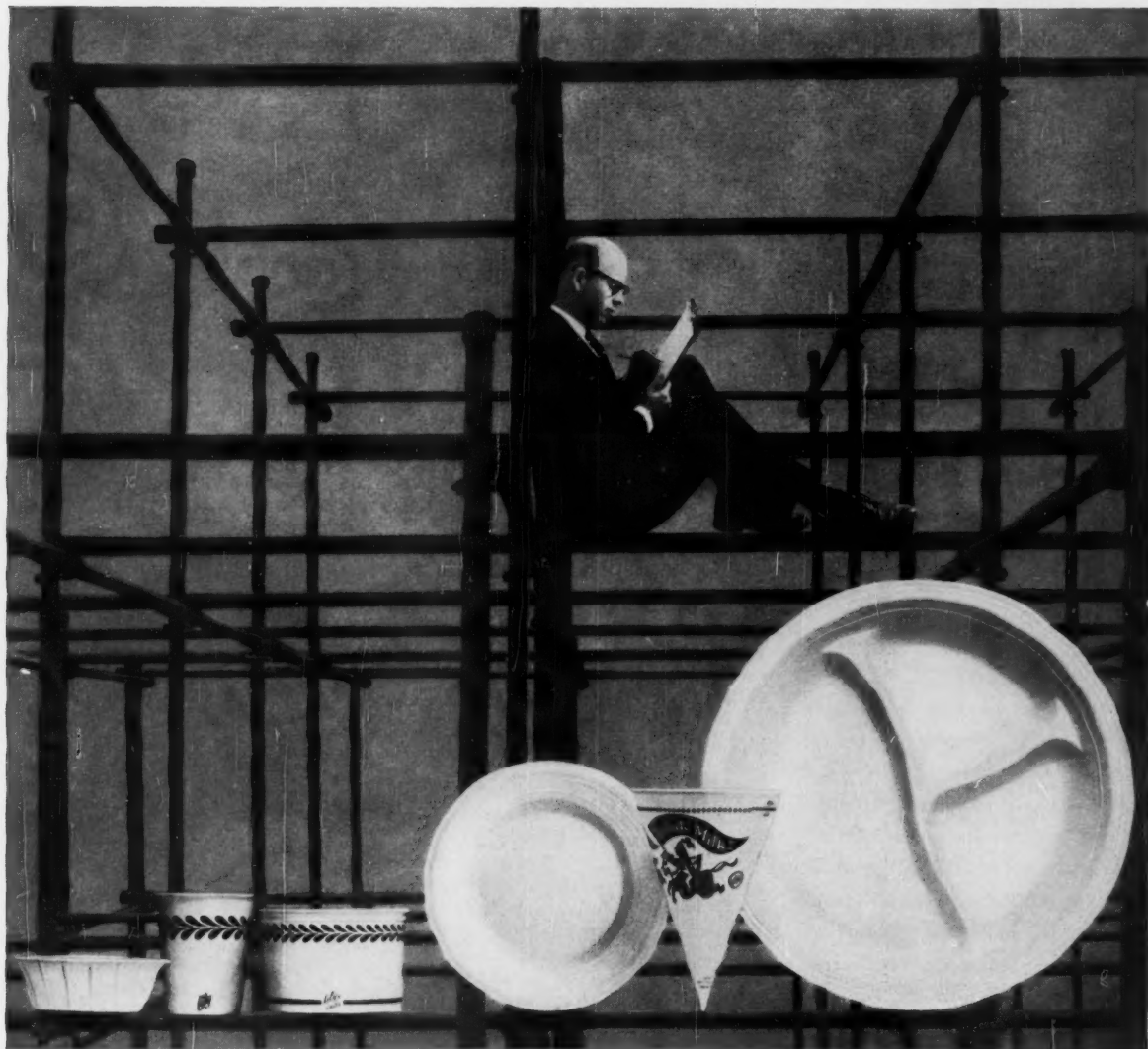
Principle of Cooperation. The school lunch program is a cooperative enterprise. The board of education as the local sponsor, the staff of the school, the school lunch personnel, and the community should work together in developing a lunch program that can be enthusiastically supported. Nor should we ignore pupil relationships. Opportunity must be made available for student councils, class officers, homeroom officers, and other student groups to sense their responsibility for successful operation of the lunchroom.

The lunch hour has been termed the most neglected hour during the school day, neglected in terms of opportunities for learning. If school lunch is not a learning experience, maybe it is because we don't permit it to be. Maybe the eat-and-run habit is being encouraged by making lunch periods shorter and shorter, by pushing in a second group before the first group is finished, by having a hot, stuffy, noisy lunchroom, by crowding the students too close together. In the entire school operation, the cafeteria receives the most complaints from faculty, students and even parents. It's easy to criticize: food too cold, food too hot, portions too small, food not tasty, no variety, rolls hard, and so forth. Must we develop the attitude, "Let's feed 'em and get it over with?" I think not. Herman Bleckschmidt, business officer of the Normandy school district in St. Louis, suggests three ways of creating an atmosphere for "better use of school lunchtime for education."

1. The physical facilities must be

From a paper presented before the New York Food Service Association.

The Man with the Lily Plan has the right answers to your lunchroom problems!



Lily Food Service Saves You Time...Money...6 Ways!

Individually, or in complete place settings, Lily® food service makes your lunchroom program easier . . . more efficient . . . more economical! Here's why:

- **Sanitary** — No chance of sanitation slip-ups here!
- **Controls Portions and Food Costs**—Lily offers the right size cup, container, dish or plate for every need.
- **Eliminates Washing and Bussing** — After use, they're thrown away. No more expensive machinery and labor needed to wash or buss. Speeds cleanup time, too!
- **No More Breakage—Accidents** — Lily paper service is safer for children . . . economical for you!
- **Saves Storage Space and Handling**—Stack easier, more compactly than traditional chinaware. Are about 30 times lighter for easier handling!
- **Quiet**—No rattle or clatter of other types of service. Makes eating more pleasant for students and staff alike!

And if you are transporting and serving from a central kitchen, paper service can be kept in inventory "on location"—

save handling, washing, storage. Shown above (left to right) are just a few of Lily's Food Service products that are being used in more and more school lunchrooms across the country.

- #1. 4-oz. Pleated Dish for salads and desserts.
- #2. 5-oz. Cold Cup for juices.
- #3. 8-oz. Hot Food container for soups, stews, casseroles. (You can bake and serve right in these Lily unwaxed Nestrites.*)
- #4. 6-in. Molded Plate for breads, pies, cakes.
- #5. 10-oz. Milk Design Cup (to be used with cup holder). Ideal for serving milk from refrigerated bulk dispensers.
- #6. 10¼-in. Molded Plate for all entrees.

Think it over. Doesn't it make sense to serve the Lily way, and eliminate practically every serving problem you have? For further information on Lily Food Service . . . without cost or obligation . . . just write to: Lily-Tulip Cup Corp., Dept. NS-20, 122 E. 42nd St., New York 17, New York. *T.M. Reg. U.S. Pat. Off.



(FAST)
(SAFE)
VERSATILE
PRO-MO-LITE

*Great...
even with
hardest
water*



Pro-Mo-Lite general-purpose liquid detergent saves you labor and money on a full range of floor cleaning jobs. Excellent for resilient and sealed wood floors... forms no soap scum on contact with free lime in old cement or terrazzo surfaces... for complete stripping or simple daily maintenance... leaves no slippery film... use with muriatic acid to clean and neutralize concrete floors in just ONE operation!



Write for
information



MASURY-YOUNG CO.
76 Roland Street Boston 29, Massachusetts
OFFICES IN PRINCIPAL CITIES

proper and adequate — good lighting, plenty of room, proper design.

2. There must be a cooperative spirit among all school personnel, including an administration that provides time for learning experiences to take place in the lunchroom.

3. There must be good school and community relations.

Principle of Adequacy. Only meals of high and balanced nutritional value should be served. This principle applies both to material needs and personal needs. There must be sufficient quantities to supply the demands of growing boys and girls. Personnel, including supervisors, must be carefully selected and be paid sufficient salary and fringe benefits to ensure a professional, well trained staff.

A program in one of Chicago's elementary schools shows what can be done. It was described in The Nation's Schools for March 1958. The principal noted that pupils who were frequent disciplinary problems often had eaten no breakfast. A survey of Grades 4 to 8 followed. It revealed that 21 per cent of the children ate no breakfast at all, and 41 per cent ate breakfast classified as poor. Only 13 per cent ate good breakfasts. Why? Because parents could not afford good breakfasts? Not at all. It was because children and parents had no knowledge of what foods are needed by growing children or even what constitutes a balanced meal for adults.

The entire school of 1150 pupils took part in a concentrated study of nutrition. Results? Parents were informed through illustrated leaflets and a nutrition fair and learned something about well balanced, low-cost meals. Students vied to see who ate the best breakfast. Teachers became more nutrition conscious. Most important, however, is the fact that a follow-up survey, taken several months later, indicated permanently established new eating habits.

Principle of Health and Safety. Only foods contributing to good nutrition should be sold in a school lunch program, and meals should be served in a healthful and pleasant atmosphere. Physical examinations should be conducted periodically to ensure the continuing good health of the school lunch personnel. Safe handling of food, proper dishwashing, and good work habits should be required. Safety hazards, such as slippery floors, unprotected equipment, unsafe electrical equipment and the like, should be repaired or replaced immediately.

Mary DeGarmo Bryan emphasized recently the importance of a good noon meal, especially if the student had no breakfast. "You can't teach a hungry student," she said. She outlined four steps whereby the school lunch can contribute to the solution of health problems. These

are: (1) provide maximum efficiency in physical environment; (2) reduce the standing-in-line time and give students more time to eat, through proper scheduling; (3) have alert and interested teachers; (4) provide teaching materials on nutrition.

Principle of Economy. The school lunch program should operate on a non-profit basis so that the charge for meals is reasonable enough for all children. State and federal reimbursement must be utilized to decrease the cost of meals and milk for all children. Meal prices must be set according to the ability to pay of the children. Meals should be scheduled so as to achieve our objectives with the least defensible time, effort and cost. If necessary, meal schedules should be staggered. Educational experiences can take place in the lunchroom only if the children are there.

A colleague of mine in a near-by suburban school district made a cost study to determine the net cost to the district if all children in the district were fed free, i.e. at no charge to the children. After making the necessary adjustments for increased participation, decreased help needed, and the like, a net cost of some \$40,000 was computed, a little more than 30 cents on the tax rate. Did the board buy it? No. But must we not think in such imaginative ways if we are to succeed in meeting our educational objectives?

Principle of Planning. The school lunch program must be continuously appraised in terms of desired aims and objectives. The professional members of the school lunch staff should be involved in planning the budget for the area. They should be involved in curriculum planning where their particular training makes them valuable. They should be consulted in the over-all planning of an educational program where this educational laboratory called a lunchroom may be utilized. The lunchroom staff must be given a sense of useful participation.

I honestly believe that those unlightened educational administrators who have not made use of school lunch facilities in promoting the learning process are not really unwilling to do so. They are in the main unaware of the possibilities for learning experiences lurking there.

As we attempt to emphasize the educational value of the school lunch program, we must not lose sight of the primary purpose of school food service: to serve an appetizing, well balanced meal in pleasant surroundings at low cost. This is really an educational objective in itself, as much as is the goal of good study habits. But the school lunch can easily serve more than one objective. Next to the good eating habits of school children, the most important objective is to have school lunch act as a catalyst for better learning in the entire curriculum. ■

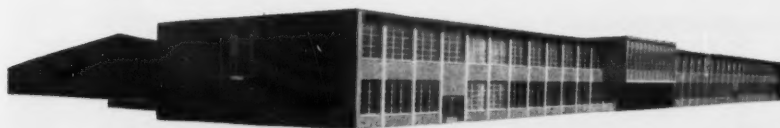


ARTS AND CRAFTS

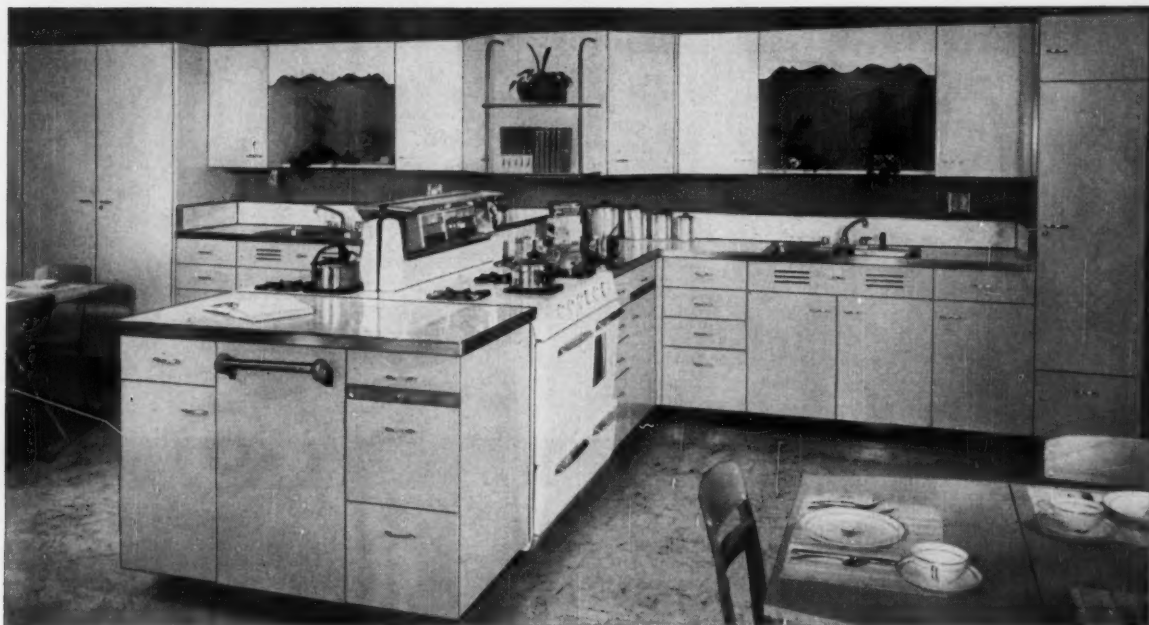


CLOTHING

a complete custom school installation by *St. Charles*



George W. Norris Junior High School,
Omaha, Nebraska,
Leo A. Daly Co., Architects
Nebraska Custom Kitchen, Omaha,
St. Charles Representative



FOODS

Maximum use of space, *complete* flexibility and built-in St. Charles *quality*—for heavy use plus long range economy—are the main reasons St. Charles Custom School Storage furniture is the ever-growing preference of teachers, administrators and school architects for *all* classroom needs.

Each St. Charles installation is custom built to meet each individual teaching situation. The result? Food, clothing, arts and crafts and classroom storage furniture *especially* built to exactly fit your needs and available space.

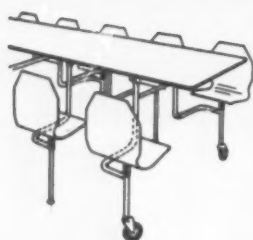
Send for Catalog: Complete.
"St. Charles Custom School Storage
Furniture." Available at your request,
on your letterhead.
St. Charles Manufacturing Company
Dept. NSS-2, St. Charles, Illinois



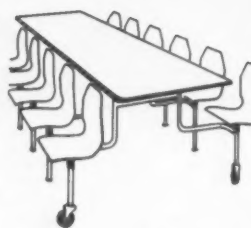
St. Charles
CUSTOM SCHOOL
STORAGE FURNITURE

School Storage Furniture for Food Labs, Clothing Labs, Arts and Crafts, and Elementary Classrooms

another S I C O first... FULL



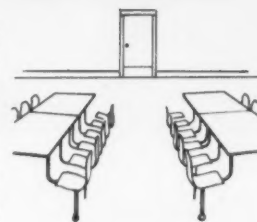
FREE-WAY SEATING . . . safe, nothing to straddle, trip, or step over. Pedestal seat support set to side to allow complete leg freedom. Backs provide comfort. Individual seats facilitate orderliness. A perfect solution for adult activities, too—such as P.T.A. meetings, banquets, club meetings.



FREE-WAY SWIVEL CHAIRS . . . mean instant, complete and orderly conversion. A lunchroom becomes an assembly room as one row of seated people simply swivel their chairs 180°. With Sico, everybody gets to see, hear and participate in perfect comfort.

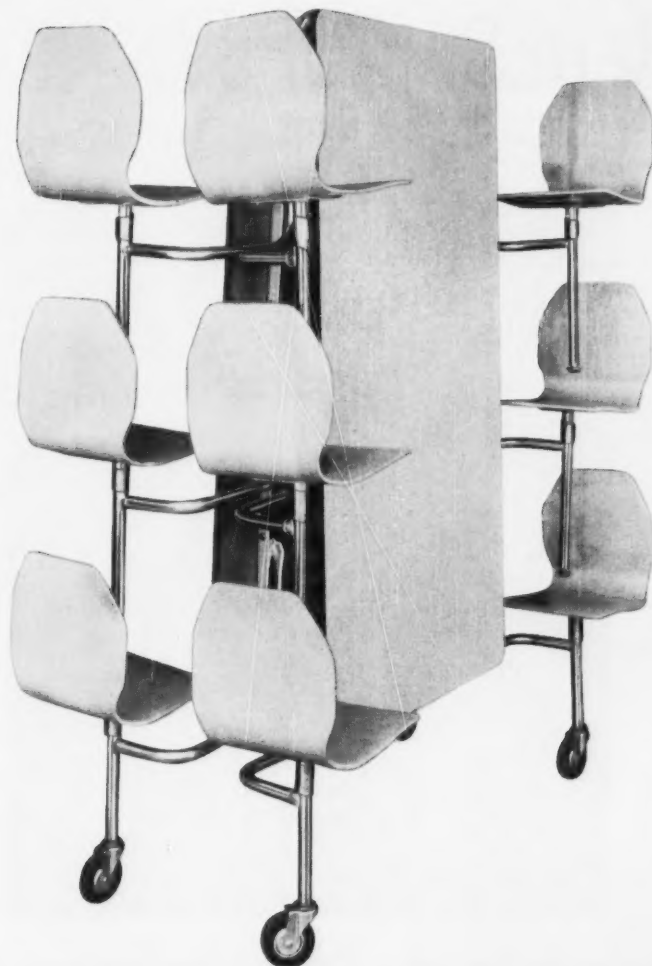


FREE-WAY COMFORT . . . in correct posture, lower cost, 360° easy-swivel stools or easy chair formed seats. There's a choice of materials in formed seats; rugged, lightweight, easy-to-clean molded plastic or contoured wood.



FREE-WAY AISLES . . . can't disappear; are always open for full, smooth traffic flow. Sico's fixed dimension seating gives a fair share of space to everybody. That's why it's so easy to maintain complete control in comfort—always!

FREE-WAY SEATING



For the first time—ANYWHERE—Sico has produced the ultimate solution to seating-space problems—full free-way seating combined with complete, efficient and modern comfort.

Sico's free-way seating means the end of disorder and discomfort by giving comfortable chair seating in one portable folding chair-table unit.

Well suited for all school levels, the Sico Model TC-65 Table combines convenience and comfort with the space saving, clutterless features of fixed dimension seating.

What a space saver in action! Now you can comfortably seat 12 at a 10 foot table—2 more than at ordinary tables with loose chairs. And, it allows you free-way-like aisle space, too. You get freer movement and at the same time can have more tables per room.

Just a flick of the chair and the Sico TC-65 Table converts from cafeteria to auditorium or assembly use. Either row turns to the direction of activity. When you want space—fast—fold them up and free-wheel them out of the way for gymnasium, dancing or other activities.

This chair-table can really take it! Its entire 14 gauge unitized steel frame is electric-arc welded for one-piece rigidity. Built to last a lifetime, the frame will withstand 2 1/4 tons load.

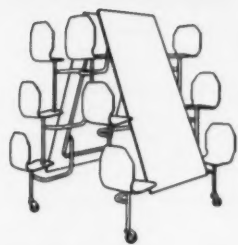
Sico's exclusive Model TC-65 Table is fully guaranteed for 10 years.

Get complete information on the Sico Model TC-65 Table, or on the complete line of Sico tables today. Write:

SICO MANUFACTURING COMPANY, INC.

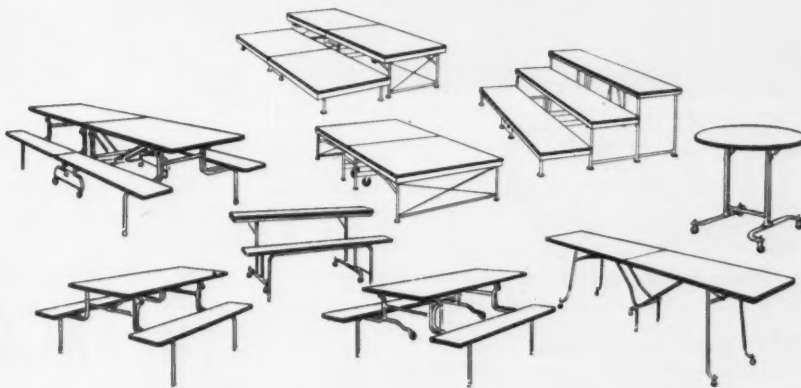
5215 Eden Avenue South

Minneapolis 24, Minnesota, Dept. 202



FREE-WAY HANDLING . . . steel torsion bar eases table open or closed—safely and quickly with no locks, latches, or hinges to pinch fingers, trap dirt, or catch clothing. Less than 30 inch closed width lets you breeze through doors on swivel casters, swish away a room full of tables in minutes.

There's a SICO table for every school seating need.



See the new Sico TC-65 chair-table combination and the complete line of Sico tables at the AASA convention booths #1125-1129.

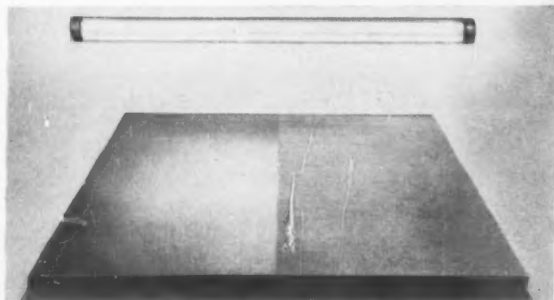
WHY A TEXTURED LAMINATED SURFACING FOR DESK TOPS?

See these features of

 **Textured Textolite®**

- Eliminates objectionable, eye straining glare. (photo below)
- Warm to the touch, pleasing to the eye . . . not glass-like.
- Reduces noticeable wear . . . stays new looking longer than conventional plastics.
- As easy to maintain as the plastic you are now using . . . washes clean with soap and water.

SURFACE MINIMIZES GLARE



The gloss range of General Electric Textured Textolite is 50% less than conventional plastic laminates. (Gloss range is 6-15 in each direction when measured by a 60° Gardiner Gloss Meter.)



While attending the American Association of School Administrators Convention, February 13-17, in Atlantic City, be sure to see the new General Electric Textured Textolite. It will be shown in the Irwin Seating Company booth, (No. E46-48), on their new MONOSTEEL desk top . . . part of Irwin's modern 3/R Line of school furniture. If you do not plan to attend the show, write for samples to General Electric Company, Laminated Products Department, Coshocton, Ohio.

GENERAL ELECTRIC COMPANY,
Dept. NS-20, Coshocton, Ohio

- () Please send me samples of new G-E Textured Textolite.
() Please have your representative call.

Name _____

Title _____

School _____

City _____ Zone _____ State _____

Progress Is Our Most Important Product

GENERAL  ELECTRIC

Book Shelf

Publications of recent copyright and of interest to school administrators

ADMINISTRATION

Administration and Policy-Making in Education. By John Walton, associate professor of education and chairman of the department, Johns Hopkins University. Johns Hopkins Press, Homewood, Baltimore 18. Pp. 199. \$5.

Administration of the School Building Program. By Wallace H. Strevell, chairman, department of administration and supervision, college of education, University of Houston, and Arvid J. Burke, director of studies, New York State Teachers Association. McGraw-Hill Book Company, Inc., 330 W. 42d St., New York 36. Pp. 430. \$7.50.

CURRICULUM

How To Improve the High-School Curriculum. By Harold Alberty and associates. A resource guide for curriculum workers. Publications office, Ohio State University, 242 W. 18th Ave., Columbus 10, Ohio. Pp. 84. \$1.

Modern High School Biology. By Dorothy F. Stone, fellow, 1958-59, science manpower project, Teachers College, Columbia University. A recommended course of study. Bureau of Publications, Teachers College, 525 W. 120th St., New York 27. Pp. 96. \$1.50.

Studies in Mathematics Education. A brief survey of improvement programs for school mathematics in elementary and high schools and in college. Scott, Foresman and Company, 433 E. Erie St., Chicago 11. Pp. 55. 50 cents.

GUIDANCE

Delinquent Behavior: Principles and Practices. Prepared by William C. Kvaraceus, director, juvenile delinquency project, N.E.A., and William E. Ulrich, teacher, Experimental Project, Boys Junior-Senior High School, District of Columbia. N.E.A. 1201 16th St., N.W., Washington 6, D.C. Pp. 339. \$2.

INSTRUCTION

Promising Practices in Nutrition Education in the Elementary School. By Willard J. Jacobson, associate professor of natural sciences, and Mary M. Hill, research assistant, nutrition education research project, Teachers College, Columbia University; and Fannie L. Boyd, assistant professor of home economics education, college of education, University of Georgia. Bureau of Publications, Teachers College, Columbia University, New York 27. Pp. 46.

INTERGROUP RELATIONS

From Color Blind to Color Conscious. A study of public school integration in New York City. American Jewish Congress, 15 E. 84th St., New York 28. Pp. 57.

The Future Is Now. Based upon the Puerto Rican Study, a report on the education and adjustment of Puerto Rican pupils in the public schools of the city of New York. New York City Board of Education, 110 Livingston St., Brooklyn 1. Pp. 31.

METHODS AND MATERIALS

Art Aids for Elementary Teaching. Revised ed. By Irma L. Paine. A handbook. Burgess Publishing Co., Minneapolis 15. Pp. 123. \$3.75.

Dimensions, Units, and Numbers in the Teaching of Physical Sciences. By Renee G. Ford and Ralph E. Cullman,

(Continued on Next Page)



TOP-MOUNTED SELF CONTAINED

HERRICK

DUAL-TEMPERATURE REFRIGERATORS

In Lifetime Stainless Steel



FREEZER SECTION



REFRIGERATOR SECTION



MODEL TSS47DT
1/2 FREEZER, 3/2 NORMAL TEMP.

MODEL TSS49DT
1/2 FREEZER, 3/2 NORMAL TEMP.

MODEL TSS49DT
1/2 FREEZER, 3/2 NORMAL TEMP.

HERRICK

BACKED BY MORE THAN 67 YEARS OF REFRIGERATION EXPERIENCE. ASK ABOUT THE COMPLETE HERRICK LINE OF REFRIGERATORS, FREEZERS AND WALK-IN COOLERS.

The Aristocrat of Refrigerators

The combination of normal cold and freezing temperatures in one compact Herrick cabinet provides faster food selection for the chef... more efficient food handling for other kitchen personnel. Gleaming stainless steel, inside and out, assures the ultimate in sanitation and cleaning ease. Edge-mounted chrome-plated brass hardware provides long, trouble-free service. Herrick Dual-Temperature refrigerators are also available for remote installation, and as Pass-Thru models.



HERRICK REFRIGERATOR COMPANY • WATERLOO, IOWA

WRITE DEPT. N FOR NAME OF NEAREST HERRICK SUPPLIER

fellows of the science manpower project, Teachers College, Columbia University. Bureau of Publications, Teachers College, Columbia University, New York 27. Pp. 47. \$1.

RESEARCH

Suggested Techniques for Conducting Talented Student Follow-Up Studies. By Donald A. Green and Robert W. Schmedding. Pupil services series No. 4, 1959. Report of a study supported by the division of guidance and testing, state department of education, Columbus, Ohio, under the National Defense Education Act. Center for educational services, college of education, Ohio University, Athens, Ohio. Pp. 35.

SCIENCE EDUCATION

Your Child in a Scientific World. A practical guide designed to help parents introduce their children to the world of science. By Albertina A. Weinlander, assistant professor of education, Wittenberg University, Springfield, Ohio. Doubleday & Company, Inc., 575 Madison Ave., New York 22. Pp. 192. \$2.95.

Magnets: the Education of a Physicist. By Francis Bitter, professor of physics, and associate dean, school of science, Massachusetts Institute of Technology. Pp. 145. **How Old Is the Earth?** By Patrick M. Hurley, professor of geology and executive officer, geology department, Massachusetts Institute of Technology. Pp. 152. **The Neutron Story.** By Donald

J. Hughes, physicist, Brookhaven National Laboratory. Pp. 150. **Soap Bubbles and the Forces Which Mould Them.** By the late C. V. Boys. Pp. 156. **Echoes of Bats and Men.** By Donald R. Griffin, professor of zoology, Harvard University. Pp. 145. Doubleday & Company, Inc., 575 Madison Ave., New York 22. 95 cents each.

SPECIAL EDUCATION

Here's Help for Your Gifted Child. Free and inexpensive materials, enrichment technics, and research projects. John F. Dean, Box 211, Newport Beach, Calif. Pp. 28. 50 cents.

STATISTICS

The Classroom Teacher and Public Relations. Research monograph 1959-M2. N.E.A. Publications-Sales Section, 1201 16th St., N.W., Washington 6, D.C. Pp. 38. 50 cents.

Salaries and Salary Schedules of Urban School Employees, 1958-59. Public school salaries series, research report 1959-R16. N.E.A. Publications-Sales Section, 1201 16th St., N.W., Washington 6, D.C. Pp. 83. 50 cents.

TEACHER EDUCATION

Teacher Preparation for Mothers Who Are College Graduates. A report on a co-operative project conducted by Yale University and the public schools of Fairfield, Conn., and financed by a grant from the Fund for the Advancement of Education. Yale University, New Haven, Conn.

VOCATIONAL GUIDANCE

Careers for Women in Retailing. Women's Bureau Bulletin No. 271. U.S. Gov't Prtg. Off., Washington 25, D.C. Pp. 48. 25 cents.

FROM SCHOOL DISTRICTS

Lipreading for the Deaf and the Hard of Hearing. Curriculum research report. Publications sales office, New York City Board of Education, 110 Livingston St., Brooklyn 1, N.Y. Pp. 103. 75 cents.

Procedures for the Program of Fire Safety in the Minneapolis Public Schools. Revised ed. Department of health, physical education, recreation and safety, Minneapolis Public Schools, 807 N.E. Broadway, Minneapolis 13. Pp. 10. 35 cents.

OF GENERAL INTEREST

Conditions of Work for Quality Teaching. Department of classroom teachers, N.E.A., 1201 16th St., N.W., Washington 6, D.C. Pp. 142. \$1.25.

The Future of Public Education. By Myron Lieberman, director, Educational Research Council of Greater Cleveland. A diagnosis and proposals for reform. University of Chicago Press, 5750 Ellis Ave., Chicago 37. Pp. 288. \$5.

A Study of Community Inaction: West Haven, Conn. National Commission for the Defense of Democracy Through Education, N.E.A., 1201 16th St., N.W., Washington 6, D.C. Pp. 34.

10 REASONS WHY A Maico Portable Audiometer WILL MAKE YOUR SCHOOL HEARING TEST PROGRAM Faster and More Convenient



- 1 It's lightweight
- 2 It has twin tone interrupters
- 3 It has lighted dials
- 4 Lateral controls allow operation without fatigue
- 5 Tests up to 40 children with extra headsets
- 6 Allows speech and bone conduction tests
- 7 Automatic muting between frequencies
- 8 Big storage compartment
- 9 Rugged carrying case
- 10 U.L. approved!

Send for
Free Booklet

TO: **MAICO Electronics, Inc.**

21 No. 3rd St., Minneapolis, Minn., Room 1068

Please send FREE booklet:

"Why & How To Conduct School Hearing Tests"

Name _____

School _____

Address _____

City _____

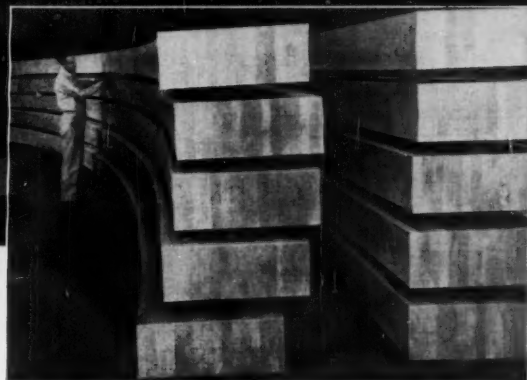
zone _____

State _____



Elmcroft Avenue School Auditorium, Norwalk, California

ARCHITECT: Kistner, Wright & Wright
CONTRACTOR: Albert Reingardt



LAMINATED ARCHES...

A Blending of Form, Function and Economy

On this job, the Summerbell glued wood laminated arches gave the architect, engineer, contractor and school district exactly what they wanted: a clean, graceful expression . . . that was structurally efficient . . . quick to erect . . . fire-resistant and economical. Next time you face a job that calls for the functional beauty of laminated wood spans, consult Summerbell's free booklet, "Roof Structures." You'll find it helpful in answering architectural, structural and budget requirements.


Summerbell
ROOF STRUCTURES



a division of
The FLUOR CORPORATION, Ltd.

GENERAL OFFICES: SANTA ROSA, CALIFORNIA. Write Box 1267R
In San Francisco: 420 Market Street, EXbrook 7-2796 • In Whittier, California: 12000 E. Washington Blvd., OXbow 3-3761

Another **IRWIN** * first



Irwin once again sets a new design and quality pattern in school furniture. Presented here for the first time, the all new line featuring the *Exclusive Alumi-Guard Vinyl Seat and Rail*. The already popular exclusive aluminum rim monosteel desk top blends perfectly with matching aluminum rim on seat and rail.

* Some Other Irwin Firsts

Irwin was the first complete-line school furniture manufacturer to pioneer, adopt, and standardize:

The self-leveling movable adjustable desk

This still-exclusive feature was first offered in the 1930's

Laminated plastic tops

First to adopt the plastic top as standard-pioneered its acceptance for school use.

One-piece Lifting Lid desk top

First to recognize that the narrow stationery strip was as obsolete as the inkwell. One-piece top gave 30% more working area.

Monosteel Top

First to offer the one piece die formed top with flush aluminum rim.



Designed by
William M. Schmidt Associates



Easily-installed Random Planks are $\frac{1}{4}$ -inch thick, 4-feet wide and 8-feet long.

*fully-finished random-grooved paneling
in six exclusive, new Trendwood® finishes*

Here's the newest in paneling for beautiful, maintenance-free school interiors. Marlite Random Plank in six distinctive Trendwood finishes will add years of wear with just minutes of care to the walls of your entrances, corridors, classrooms, offices, assembly halls, libraries, kitchens, laboratories, cafeterias, restrooms and other service areas.

Your own maintenance men can install Random Plank over furring strips or existing walls without interrupting school activities. And this melamine

plastic-finished paneling needs no painting or further protection. It resists stains and mars for years—cleans in minutes with a damp cloth!

Whether you are planning to build or remodel, investigate Marlite plastic-finished paneling . . . available in a wide variety of sizes, colors, wood, marble, decorator and tile patterns. Your architect, contractor, building materials dealer will give you full details—or write Marlite Division of Masonite Corporation, Dept. 234, Dover, Ohio.

Marlite® *plastic-finished paneling*

6003

MARLITE IS ANOTHER QUALITY PRODUCT OF MASONITE® RESEARCH

"CUSTOM-BILT BY SOUTHERN" DISTRIBUTORS

- ALABAMA:** BIRMINGHAM—
Vulcan Equip. & Supply Co.
MOBILE—Mobile Fixture Co.
- ARKANSAS:** LITTLE ROCK—
Krebs Bros. Supply Co.
- COLORADO:** DENVER—Carson's Inc.
Arnholz Coffee & Supply Co. Inc.
- FLORIDA:** DAYTONA BEACH—
Ward Morgan Co.
JACKSONVILLE—
W. H. Morgan Co.
MIAMI—J. Conkle, Inc.
ORLANDO—Turner-Haack Co.
ST. PETERSBURG—
Staff Hotel Supply Co.
TAMPA—
Food Service Equip. Co., Inc.
- GEORGIA:** ATLANTA—
Whitlock Dobbs, Inc.
- ILLINOIS:** PEORIA—Hertzel's Equip. Co.
- INDIANA:** EVANSVILLE—
Weber Equip. Co.
INDIANAPOLIS—
National China & Equip. Corp.
MARION—
National China & Equip. Corp.
- IOWA:** DES MOINES—Bolton & Hay
- KANSAS:** WICHITA—
Arnholz Coffee & Supply Co. Inc.
- KENTUCKY:** LEXINGTON—
Heilbron-Matthews Co.
- LOUISIANA:** NEW ORLEANS—
J. S. Waterman Co., Inc.
SHREVEPORT—
Buckelew Hdwe. Co.
- MARYLAND:** BALTIMORE—
The John Hoos Co.
- MASSACHUSETTS:** BOSTON—
Thompson-Winchester Co., Inc.
- MICHIGAN:** BAY CITY—Kirchman Bros. Co.
DETROIT—A. J. Marshall Co.
GRAND RAPIDS—
Post Fixture Co.
- MINNESOTA:** MINNEAPOLIS—Aslesen Co.
ST. PAUL—
Joesting & Schilling Co.
- MISSOURI:** KANSAS CITY—
Greenwood's Inc.
ST. LOUIS—
Southern Equipment Co.
- MONTANA:** BILLINGS—Lamb's, Inc.
GREAT FALLS—
Houseman & Co. Inc.
- NEBRASKA:** OMAHA—Buller Fixture Co.
- NEW MEXICO:** ALBUQUERQUE—
Bill Zee Fixture Co.
- NORTH CAROLINA:** ASHEVILLE—
Asheville Showcase &
Fixture Co.
CHARLOTTE—
Hood Hotel Supply Corp.
- NORTH DAKOTA:** FARGO—
Fargo Food & Equip. Co.
- OHIO:** CINCINNATI—H. Lauber & Co.
CLEVELAND—S. S. Kemp Co.
COLUMBUS—
General Hotel Supply
TOLEDO—Rowland Equip. Co.
YOUNGSTOWN—
W. C. Zabel Co.
- OKLAHOMA:** TULSA—Goodner Van Co.
- PENNSYLVANIA:** ERIE—A. F. Schultz Co.
PITTSBURGH—
Flynn Sales Corp.
- SOUTH CAROLINA:** GREENVILLE—
Food Equipment Co.
- TENNESSEE:** CHATTANOOGA—
Mountain City Stove Co.
KNOXVILLE—Scruggs, Inc.
MEMPHIS—House-Bond Co.
NASHVILLE—
McKay Cameron Co.
- TEXAS:** AMARILLO—
Arnholz Coffee & Supply Co. Inc.
CORPUS CHRISTI—
Southwestern Hotel Supply, Inc.
SAN ANTONIO—
Southwestern Hotel Supply, Inc.
- UTAH:** SALT LAKE CITY—
Restaurant & Store
Equipment Co.
- VIRGINIA:** RICHMOND—
Ezekiel & Weiman Co.
- WEST VIRGINIA:** CLARKSBURG—
Parson-Souders Co.
- WISCONSIN:** MILWAUKEE—S. J. Casper Co.
- WYOMING:** CASPER—
② Knapp Equip. & Supply Co.

"Custom-bilt by Southern" as specified —



WALTER SCHROEDER HALL, MARQUETTE UNIVERSITY

Milwaukee, Wisc.

Architect: E. Brielmaier & Sons • Dealer: S. J. Casper Co. Inc.

Every "Custom-bilt by Southern" installation is the result of combined teamwork. Architect, Consultant, Owner and "Custom-bilt by Southern" Distributor all contribute to the effectiveness of a profitable food service installation.

From initial floor plan, to final installation and demonstration of equipment, your "Custom-bilt by Southern" Distributor should be consulted and made part of the planning team. He will make sure the job is completed as specified and will be available for years of competent maintenance.

Contact the distributor nearest you—take advantage of his experience and skill. He'll help you any way he can.

"Custom-bilt by Southern" installations have received 102 awards from Institutions Magazine including Walter Schroeder Hall which received a Honor Award in the 1959 contest.

SOUTHERN[®] EQUIPMENT COMPANY
4536 GUSTINE AVE. • ST. LOUIS 16, MO.
EASTERN DIVISION OFFICE—125 Broad St., Elizabeth, N. J.

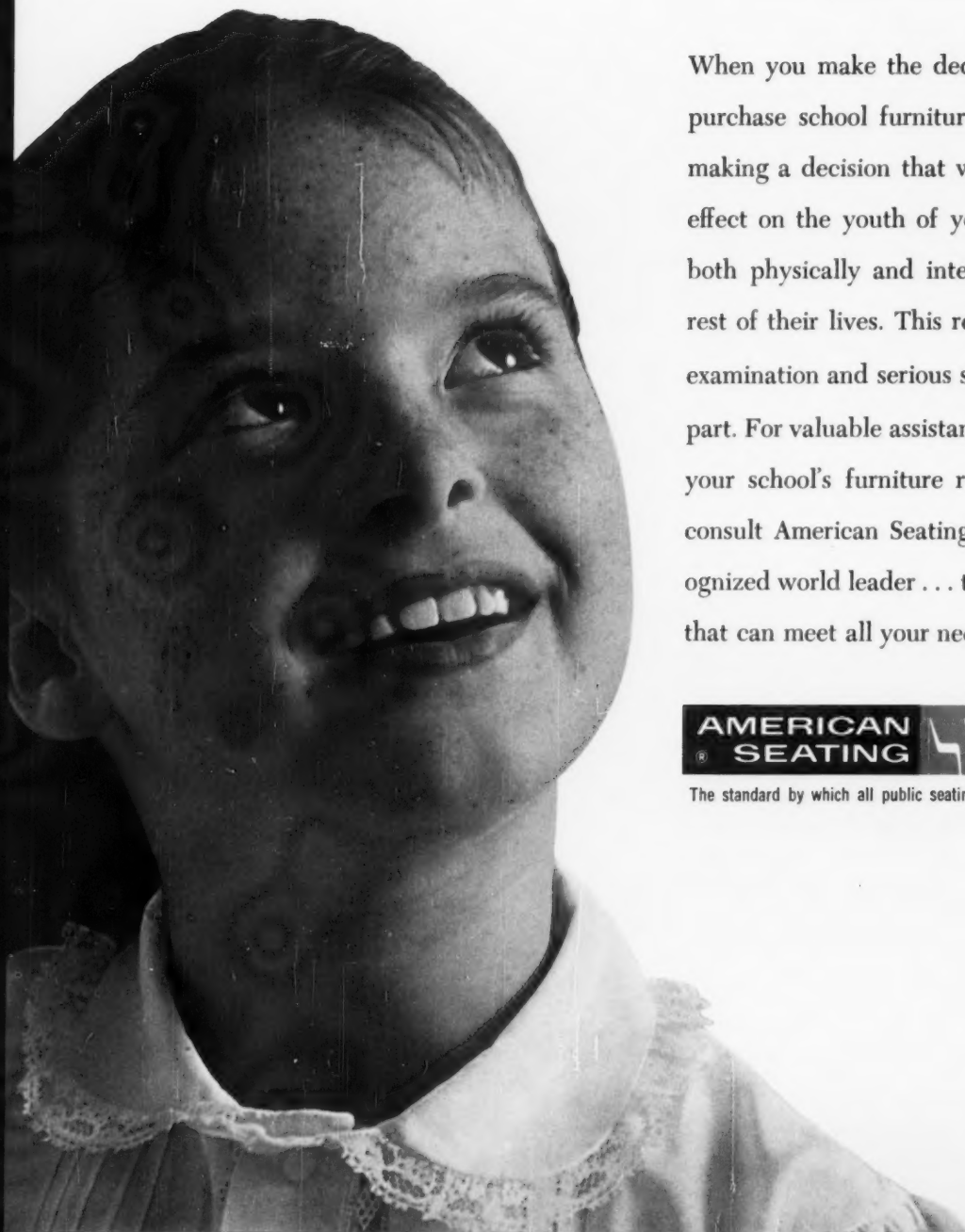


Think in terms of bright-eyed youngsters

When you make the decision to select and purchase school furniture you are making a decision that will have a profound effect on the youth of your community, both physically and intellectually, for the rest of their lives. This requires critical examination and serious study on your part. For valuable assistance in filling your school's furniture requirements, consult American Seating, the recognized world leader . . . the only source that can meet all your needs exactly.



The standard by which all public seating is measured





I need portable and permanent
auditorium seating



No. 16-001 BODIFORM® Chair with
123 aisle standard

No. 60 Upholstered Folding Chair



Our school uses
chair-desks



No. 542 Classmate® Desk



I prefer one-piece
movable units



No. 2634
Individual Study-Center*



I want to have
tables and chairs



No. 549 Classmate Open-Front Table with **No. 540-A** Classmate Chair

You get all four, and more, from American Seating



The standard by which all public seating is measured

GRAND RAPIDS 2, MICHIGAN

MANUFACTURERS OF SCHOOL, CHURCH, AUDITORIUM, STADIUM, THEATRE,
HOSPITAL, AND TRANSPORTATION SEATING; FOLDING CHAIRS AND TABLES

*T.M. ASCo.

©1960 American Seating Co.

6545-1

LOOKING FORWARD

There Are Kinder Ways

SHOULD the school superintendent sit at his desk from 8 o'clock in the morning until 5 o'clock at night? Is his job primarily to be the chief clerk of the office?

This seems to be the thinking of a county school board in Michigan, which summarily dismissed its superintendent for alleged failure "to keep regular office hours."

This accusation and a few others even more questionable were handed to the superintendent along with the statement that the board had as of "this day terminated" her contract. Her salary and vacation credit also were stopped abruptly, although her attorney reports that her three-year contract* does not expire until June 30 of this year.

This happened to a school administrator who has served her district with distinction for 30 years. It is another version of the American tragedy that we discussed a few months ago. In this case, the superintendent is within two years of the traditional retirement age of 65. During her three decades as superintendent of Genesee County schools, Daisy Howard had served two terms in the highest honor the teaching profession can accord one of its members, namely the presidency of the state teachers association (Michigan Education Association). Previously she had been vice president, and a member of the board of directors for several years. She had served under three different governors as a member of the Michigan Teachers' Retirement Fund Board. Locally, she had been honored with such offices as president of the Flint Federation of Women's Clubs and president of the Flint Chapter of Zonta International.

Mrs. Howard was professionally trained for her work, having an A.B. degree from Eastern Michigan University and an M.A. degree from the University of Michigan. The Ypsilanti institution also had presented her with an honorary master's degree, in recognition of her service to public education in Michigan. She staunchly advocated the reorganization of school districts into larger and more efficient units, and during her administration the number of districts in Genesee County was reduced from 132 to 31 (outside the city of Flint).

The board's statement listed five incidents of alleged objectionable practices. Mrs. Howard reports that these judgments had been made at an earlier meeting of the board where she was not present, and thus she had no opportunity to hear them or to answer them. To repeat these charges in print gives them unwarranted publicity and yet they need to be examined. Do they seem to be

so serious and so urgent that immediate dismissal was required for an administrator whose work had been so highly regarded for many years and whose contract had seven months yet to go?

To the assertions that she refused to let teachers attend regular seminars and that she used physical violence in evicting a teacher, Mrs. Howard makes emphatic denials. To the accusation that she advised staff members regarding (1) the budgeting of their time on field calls and (2) the making of reports, Mrs. Howard answers that such counsel is in accord with the responsibility of a chief school officer.

The fifth charge was that she did not stay in the office for regular fixed hours. Here is a most peculiar notion as to how the superintendent of a school district the size of Genesee County could and should operate.

The unpleasantness in Genesee County goes beyond the attitudes of the county board of education. It evolves basically from the faulty structure on which the county school board is based, a mistake that may be found in more than a few school districts around the nation.

The trouble dates back about 12 years to the time when the state legislature set up a plan for the selection of a chief school administrator in each county to supersede the popular election of a county commissioner on a political party ticket. Now *each* school district in the county, regardless of its size, sends one of its board members to a county biannual meeting in June. At this meeting the representatives of the district school boards elect the county board. At two consecutive meetings, two members each are elected for six-year terms. At the third biannual meeting one member is elected for a six-year term. This board hires the county superintendent.

Here then is a board that is not chosen by the people of the county, but by a hand-picked group of board members. Candidates for the county board are not required to obtain nominating petitions. In fact, they need not make known their intentions to seek office until the actual biannual meeting of school board representatives. When selected, the county board members are not subject to recall by the people and yet they hold office for a six-year term.

Perhaps the most undemocratic phase of the entire plan is the fact that one board member representing a very small district carries equal voting power with the representative of a large city. For example, one district just outside of Flint has less than 35 children in its total enrollment. Near-by Flint has more than 36,000 pupils in its public schools, and yet it has only one vote. Each of the 32 districts in Genesee County is represented by only one vote in the election of the county school board.

*The Michigan Education Association has taken steps to protect Mrs. Howard's contractual equity.

The teaching profession and the public, in Michigan and elsewhere, might have a higher regard for the Genesee County school board had it frankly said: "We disagree with you, Mrs. Howard, on policies and when your contract is up we do not plan to renew it." Instead, the board handicapped and humiliated her.

There are kinder ways to close the career of a professionally trained administrator, and especially one who had devoted most of her career to serving the same district.

The summarial manner of Mrs. Howard's dismissal will bring to mind for many readers a similar situation that confronted Herman L. Shibler at Indianapolis. Fortunately for the public and for school administration, his dismissal is being investigated by the N.E.A. Defense Commission. If they did not violate the contracts, the boards at Indianapolis and at Genesee County are probably within their legal rights. However, they are also accountable at the bar of public opinion.

Mission Accomplished!

ITS mission accomplished, the National Citizens Council for Better Schools has terminated all activities. Thus a commendable movement writes a wise finis to a decade of unique service.

When this movement was organized a decade ago there was great need for it. Public interest in education was at a low ebb. Classroom and teacher shortages were serious in those days, too, but few laymen seemed to know about it, or care.

Launched originally in May 1949 as the National Citizens Commission for the Public Schools, its purposes were to arouse citizen interest and to help communities organize for school improvement. This was several years before sputnik had startled this country into a realization that we were running in second place in space science. This was eight years before Congress, alarmed by sputnik, adopted the National Defense Education Act with its great stimulus to science education.

The National Citizens Commission was doing its missionary work long before Rickover and Conant had made education front-page news. Undoubtedly, much of today's interest in public education was sparked by the vigorous and continuous program of this citizens' movement in the pre-sputnik era. Writing in this magazine a few years ago, H. M. Hamlin of the University of Illinois appropriately observed: "The Commission contributed to a reversal of trends which, if continued, might have destroyed American public education or rendered it impotent. Its greatest influence seems to have been in helping to revive a sense of responsibility to public education on the part of our citizens . . . There would have been a vital citizens' movement without the Commission, but the Commission hastened its development, cleared information from states and communities, and helped to give order, form and meaning to the spontaneous, diverse and often misguided efforts of local and state groups of citizens."

If it has been such a great help to schools, why should this voluntary citizens' movement be discontinued? The answer is: Because it was definitely organized as a tem-

porary aid, not as a permanent structure! It's like a booster rocket on a missile. Its purpose is to get the projectile under motion as rapidly as possible and then remove itself so as not to handicap the projectile in its total orbit. Both the Commission and the Council which succeeded it in 1956 were extralegal in form; its policy makers were appointed laymen, responsible to no one except themselves.

In the final analysis, the responsibility for public education centers in the school board and not in any extralegal group. The citizens' movement, first under the leadership of Roy E. Larsen and later under Henry Toy Jr., constantly recognized this principle. It sought to strengthen the school board and to emphasize its role. Probably one of the factors leading to the discontinuance of the National Citizens Council has been the great growth of school board organizations on state and national levels. Logically, the National Citizens Council has turned over to the National School Boards Association its printed materials for further distribution to the public and the profession.

No one assumes that the need to arouse citizens to the importance of their schools is any less important now than it was 10 years ago. Nor will it be any less important 10 years from now. But the National Citizens Council or any other voluntary citizens' movement should not be the permanent crutch upon which we continue to lean. Greater responsibility now falls upon legal, professional and other more representative organizations to shoulder the assignment that is inherently theirs.

And so we say to the Citizens Commission and its successor, the Council, and to the Carnegie Foundation, which provided much of the funds: The nation and the profession express tremendous appreciation for the immeasurable achievements of your 10 year program. We also commend you for your wise decision to step out of the scene, now that your earlier efforts are bearing fruit, and other agencies, more numerous and more representative, are strong enough to do your share of the work in the vineyard.

It's for You

AS THE instructional leader of his school system, the school administrator is keenly aware of the upheaval in the teaching of the sciences. Even so, he may be surprised to discover the extraordinary scope and depth of these changes, as described in this month's magazine. Within the next 46 pages some of the best science educators in the nation report facts and ideas that the administrator needs to know.

The magazine's own editorial energies have been directed into two nationwide surveys of outstanding practices and trends. The entire study is extensively illustrated. We sincerely believe that this special issue on science education is the most concise administrative approach to the subject ever published.

The Editor

A PLAN FOR *Quality* IN SCIENCE EDUCATION

ROBERT H. CARLETON and JOHN W. RENNER

National Science Teachers Association, Washington, D.C.

THOMAS PAINE once said: "These are times that try men's souls." Administrators and others having responsibility for today's school science programs may be tempted to repeat Paine's famous words. What makes these positions of leadership so trying is that from every quarter schools are being given advice, often contradictory in nature, on how the science program should be changed.

This situation stems from the fact that more people, and more different kinds of people — military leaders, business people, columnists, and "ordinary citizens," as well as scientists — have become more aware of the important role that science plays in their lives and in our national security. They expect the schools to do something to ensure that we will not have the cloud of national "scientific inferiority" hanging over us.

To most people, curriculum and school are synonymous. The public, consequently, expects the school to adjust its curriculum to enable the children to become "scientifically superior." Educators know, however,

that to change the science curriculum means to change the operation of the entire science program of the school.

The polemic question then is, what, if any, changes should be made in the science programs of schools better to meet the compelling needs of today and of the decades ahead. How can school administrators determine whether their school science programs are meeting these needs? The administrator cannot personally direct each curriculum in his school system to ensure that purposes are being met. Nor is it necessary that he do so, any more than it is necessary that he be an expert in science or science teaching to determine the adequacy of the science program. As an educational leader, however, he can put into operation the forces that will yield and put into effect adequate, effective curriculums.

To obtain the data that an administrator will need to enable him to exercise adequate leadership in science education, we suggest that he investigate his science program from four general positions:

1. Its objectives.

2. The curriculum being used to accomplish these objectives.

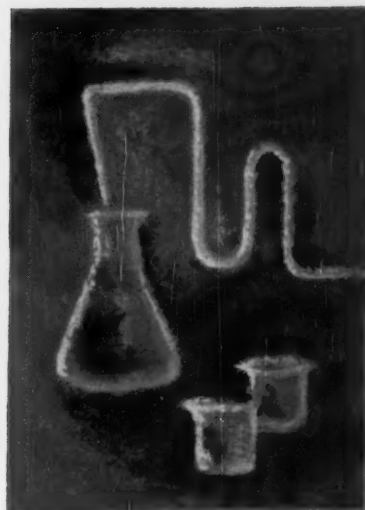
3. The personnel implementing the curriculum.

4. The budget and administrative procedures used by the personnel.

In order to obtain concrete evidence for the evaluation of the foregoing categories and, simultaneously, to develop some guidelines for future development, let us expand the four categories into questions.

1. What changes are necessary in the objectives of science education in order to align it with current developments in science and education?

Science is made up of two main parts: its processes and its products. Science educators have long insisted that understanding and some control over the processes (often called the scientific method) are more important to more people than is mere knowledge of the products (scientific facts). But the many pressures for science students to do well on various examinations and in various contests, and the manner in which most textbooks have



Robert H. Carleton has been executive secretary of the National Science Teachers Association since 1948. Previously he was associate professor of chemistry at Newark College of Engineering in New Jersey in 1946 and 1947, and later was associate professor of physical science at Michigan State University, East Lansing. Mr. Carleton taught for 20 years at high schools in Ohio and New Jersey, and has been part-time instructor at New York University. He is author and co-author of textbooks in general science, chemistry and physics.



been written, have forced many science teachers to emphasize the scientific products and neglect the scientific processes.

Many students taking high school science will not enter college, and most of those who do will not pursue science as a career. If the "nonscience" students are to profit maximally from their experiences in science, it will have to be from their developing facility with the scientific processes, because scientific facts are too easily forgotten. Concepts and generalizations in science are important for the general education of all. These concepts and generalizations are more easily understood, are more nearly permanent, and are of greater general education value when derived through study and use of the scientific process than when approached through rote memory.

THE OBJECTIVES of science education should emphasize the process more than the product.

CONCEPTS and generalizations have their greatest educational value when mastered through the scientific processes.

CONTESTS and examinations should be deemphasized to enable students to have more experiences with the scientific processes.

2. What grade levels should be included in the science programs of today's schools?

Donald G. Decker, president of the National Science Teachers Association, recently said: "Today the majority of life experiences of children and their parents involve science in some way. As a result, an increased interest in this subject has been witnessed at each level."^{*}

Dr. Decker has clearly indicated that student interest in science will not be bounded by "grade markers." The

science program of today's schools, therefore, should be carried on from kindergarten through the 12th grade. The concepts that children encounter at each grade level, however, must be appropriate to that grade level and based on the concepts previously learned. This means that the science experiences of children must be continuous from their beginning to their culmination. The point at which these experiences should be culminated varies with the individual child and will be discussed later.

Dr. Decker makes these points:

Continuous experiences in science must be available for all children from kindergarten through the 12th grade.

Students at every grade level can learn some concepts in each area of science.

Science concepts studied from K-3 should allow a child to describe his environment and show him that scientific thinking bases ideas on facts.

Grades 3 to 6 science should enable children to describe and explain their environment, equip children to plan for the solution of and solve simple problems, and equip children to select pertinent information without bias.

Science in Grades 7 to 9 should allow children to describe, explain and evaluate their environment, develop problem solving skills that enable them to study independently, and understand that the scientific process enables them to analyze evidence and make generalizations.

Senior high school science should allow the student to describe, explain, evaluate and predict causes and results of activity in major areas of science, become proficient in problem solving, and base conclusion on facts.

3. What curricular changes are needed in the secondary school science program, and who should make them?

The courses taught in today's science classes should reflect the modern

developments in science and education. In the past, too much time has been devoted to discussing technological processes and products.

SCIENCE COURSES must be built around major scientific concepts so the teaching of the scientific processes can take precedence over the scientific products.

A student's laboratory experiences must be more than verifying something that he already knows or completing blanks in a laboratory manual; in most cases, he need not do the experiment to be able to fill the blanks. The experiments should guide the student to observe, collect and evaluate data and to draw conclusions based on these data. Laboratory experiences should motivate students to further investigations and should provide guidelines for future experimentation.

THE LABORATORY should be the place where the scientific process ceases to be a discussed topic and becomes a working tool.

The education of today's children would be incomplete if they were not allowed to explore both the biological and the physical sciences. A great many schools allow their students to graduate with either biology or a physical science. To produce a well rounded citizen, courses in biological science and a physical science course (which contains the elements of physics, chemistry, earth science, and space science) should be required of all graduates.

BIOLOGICAL AND PHYSICAL SCIENCE beyond junior high school general science should be required for all students.

The responsibility of curriculum revision rests ultimately with the classroom teacher. He is the one who knows student needs and will implement the curriculum. The classroom teacher needs the advice and counsel of administrators, science educators,

^{*}Decker, Donald G.: Science, K-12. N.E.A. Journal, April 1959.



John W. Renner recently joined the staff of the National Science Teachers Association as associate executive secretary. His career has been that of a teacher except for two years, 1956 to 1958, when he was director of the Radiological Defense School for the federal Civil Defense Administration in Battle Creek, Mich. Since 1946, he has taught at colleges and universities in Minnesota, South Dakota, Illinois and Nebraska. Dr. Renner is also the author of a filmstrip series called "Physics for Today."

and practicing scientists. Such cooperation will ensure that the curriculum is administratively feasible, teachable and current.

Recently many science programs have been developed by specialists. These programs are excellent and save the school and teachers much time, energy and financial resources. Each of these programs, however, must be evaluated by the science faculty of the school to make sure that the particular program's objectives and the objectives of the school's science program are in harmony.

EVALUATE each emerging science curriculum for your school; be open-minded, but be cautious.

4. What type of teacher is necessary to implement the science program in today's secondary schools?

The science teacher must be broadly trained in many areas of science, and deeply trained in one or more. His background must encompass all major scientific fields, and his understandings of one field must be such that it complements another. Good biology teachers should be able to integrate physics, chemistry and mathematics into their classes, and good physics and chemistry teachers must know the biological implications of their subject matter. All science teachers should have such facility with mathematics that the students begin to feel that mathematics is the language of science.

A knowledge of the history of science will also enable the teacher to teach the scientific process (and product) from a developmental and humanistic point of view. Studying the history of science will also convince students that there is much to be gained from making a mistake.

The science teacher also knows boys and girls. He understands and can apply the principles of educational psychology. Educational evaluation,

methodology and an understanding of the goals and purposes of the American educational system are also "tools" at the science teacher's command.

This is *the science teacher*. Others who may occupy the science classroom but who have serious deficiencies in one or more of the foregoing respects might be able to teach the products of science, but the processes of science will undoubtedly suffer.

THE SUBJECT-MATTER education of the science teacher must have breadth as well as depth. The science teacher must be a competent educator.

5. How can good teachers be attracted into and held by the education profession?

Salary is the primary reason given by young former teachers when asked why they left the profession. However, there is usually more to this than just having enough income to live comfortably. Hidden within this reason is the fact that in our culture low salaries do not command prestige and respect. The position of science teaching, consequently, does not command adequate respect within the community. Many people say that the average salary of today's teachers compares favorably with other wage earners in our country. The schools are *not* competing in the labor market for the *average* wage earner; they are competing for a highly trained specialist. In the field of science many other organizations are also competing for this specialist, and the starting salaries of teachers are among the lowest of all the professions.

SCHOOLS are not competing in the labor market for the *average* wage earner. To attract and hold science teachers, salaries must be raised.

Young teachers want opportunities for further study. Summer school, special science institutes, and the op-

portunity to meet with science teachers and scientists are activities that the school can encourage and that will contribute to the holding power of the profession. Most science teachers like to "snoop" in the laboratory, and usually many of their students like to "snoop" with them. Opportunities for teachers and their students to do small-scale research is a potent influence in holding science teachers. In addition, such research experience is invaluable to the students.

PROVIDING OPPORTUNITIES to teachers for further study, both formal and in their own laboratory, will contribute to the attractiveness and holding power of the science teaching profession.

6. Should school systems employ science supervisory personnel?

The science program in Grades K to 12 must be continuous. Each experience must be built on a preceding experience. Duplication and omission are two cardinal offenses often committed in the science curriculums in our schools. Duplicating subject matter from grade to grade gives the student a feeling that the areas of science are not as large as they are claimed to be. This can result in boredom, disinterest and a feeling of futility with respect to science.

Omission of certain experiences at lower levels that are needed for future experiences at higher levels can be serious. When the learner cannot logically progress from the known to the unknown, frustration levels will go up, discipline problems will result, and further learning is impaired. The school science program should be administered in such manner that the students will progress from kindergarten to the 12th grade without encountering duplication (except for review) or omissions. Such a program must be administered by a person who has demonstrated competence in science, administration and in the sci-

ence classroom. This supervisor (often called a coordinator or a consultant) will provide leadership for planning science education in Grades K to 12 and will be in a position to see the scope of the entire program and not just "bits and pieces" of it as classroom teachers often do.

THE SCIENCE SUPERVISOR is an important cog in the instructional wheel. Through him the entire program is planned, coordinated and implemented, and through it he furnishes valuable inservice training.

7. Should teacher and student time and financial resources of the school be invested in science fairs, projects and the like?

If you have ever visited a science fair, perhaps you have been tempted to revise the old adage, "All that glitters is not gold," to "Just because it glitters it isn't science."

Student science projects and research activities are among the most valuable experiences a science student can have. The biggest value of the project experience, however, does not come primarily from the construction, painting, labeling and nursing of an exhibit. Rather, it comes from the study of a specific problem — the gathering of data from the project, the processing of these data, and the preparation of a truly scientific report. When scientists meet, they do not bring crates of equipment with which to demonstrate their latest research.

Great progress has been made toward organizing such meetings for high school science students. The senior and junior academies of science in some states (Minnesota and Ohio, for example) have been very active in getting such activities organized. New York State has done much in these lines through student science congresses.

This is not to say, however, that school science displays are totally without value. Fairs and exhibits, when carefully planned in harmony with sound educational objectives, can contribute to student motivation and achievement and to better public understanding of the science program.

For nine years, the National Science Teachers Association and the American Society for Metals have conducted a program that encourages student project work and the preparation of

scientific reports. These reports are entered into competition with other students in their part of the country. This program, "Science Achievement Awards for Students," has increased in scope and size every year. It encourages the development of scientific processes and offers students both encouragement and recognition.

STUDENT PROJECTS and activity of the research type in science should be encouraged. In these programs the scientific process must be nurtured and developed without other learning experiences being sacrificed. Gadgets must not be mistaken for science.

8. Can administrative adjustments be made within the school which will increase the effectiveness of the school science program?

Administrative adjustments should not be made that will throw the balance between the content areas out of adjustment in favor of science. On the other hand, many present programs contain so little science, or are of such poor quality, that they are out of balance in favor of other areas. Schools must still educate all the children of all the people, and they must also educate the whole child. Several things can be done to increase the effectiveness of science in the balanced program.

Forty-minute periods are not long enough to accomplish much in a science laboratory. When two such periods are set aside twice a week, the program is forced into the mold of having laboratory on these days. Laboratory work should come when it is needed and not when it is administratively convenient.

LABORATORY PERIODS from one hour to 70 or 80 minutes long are necessary daily if the senior high science laboratory is to function properly.

Maintaining a supply and equipment room is an exacting and time consuming task. If supplies and equipment are not maintained, the effectiveness of the science program is seriously damaged. Getting a science laboratory ready for use takes time.

THE QUALITY of the science program and of instruction can be greatly aided if the science instructor is given time to prepare for and maintain the science facilities.

Periodicals, reference books, and textbooks are an important part of any science department. Something as simple as providing a few bookshelves in the classroom so that reference materials are available when needed can be a very important contribution in increasing effectiveness.

The last administrative recommendation costs a nominal amount of money. Part of this money would be spent for increasing the number and quality of reference works kept on the classroom reference shelf. The remainder of these funds should be made available to the teacher to employ his better and/or most interested students to work as laboratory assistants under his strict supervision. Employing students can be a valuable educational experience for them.

A full-time laboratory assistant (not a student) should be available for each two or three regular classroom teachers in the department.

PROVIDE FULL-TIME LABORATORY ASSISTANCE for each two or three teachers if possible. If not, assign no more than five classes or two different preparations daily for any teacher and allow one completely free period per day. Or, give no more than four classes or assignments and two "free" periods daily for teachers with three or more fields in which to make preparation. A small amount of money spent on student and/or full-time laboratory assistance saves the teacher much time and energy and may save a teacher for the profession.

Where to From Here?

From philosophy to the administrative decision that puts a plan into action is an enormous area. In it there are many more than the eight topics discussed here that administrators, supervisors and science teachers must consider in making decisions about the K-12 science program necessary in today's schools. These eight topics are merely intended as guidelines to the type of decisions that must be made by the persons responsible.

As a final guideline, think big, think boldly, think ubiquitously, and act accordingly. In the future as we look back on this era of experimentation in science education, the competent educator will need to regret only those educational experiments which he did not himself try.



BIOLOGY STUDENTS collect sea anemones, chitons, mussels and other forms of marine life as part of their assignment at a National Science Foundation's summer institute. Here the students are collecting forms found in the intertidal zone on the coquina rock exposed at low tide at Marineland, Florida.

**With institutes, fellowships,
inservice training, and research,**

National Science Foundation Upgrades Teaching of Science

This article was prepared by several staff members of the National Science Foundation following a conference with the editor of *The Nation's Schools*

SCIENCE — like its handmaiden, technology — has become the hallmark of our era. It has become an essential foundation stone of our whole way of life. Both the internal economy of our nation and its position in the community of nations seem to be inextricably linked with the progress of science and its applications.

Viewed in this way, it is clear that science, including mathematics and engineering, is not the exclusive domain of the professional scientist. The progress and understanding of science, what it really is, how it came to be, its significance to our welfare in the broadest sense, the totality of its impact — all these should be the common knowledge and property of all citizens.

Since science is an intellectual system, its association with the educational community is fundamental.

Further, this relationship must not be limited to certain educational levels. Science and its import as well as its uses must necessarily be woven into the fabric of the entire educational process — in the proper ways and in proper degrees. The relationship of science to history, philosophy, social welfare, and the arts needs to be emphasized rather than ignored.

Foundation does not determine educational policy. Thus, when the National Science Foundation was created by an act of Congress in 1950, it was charged with a responsibility "to develop and encourage the pursuit of a national policy for the promotion of basic research and education in the sciences." It should be noted that the Foundation is neither directed nor authorized to *determine* educational policy, nor even to specify the federal

THE NATIONAL SCIENCE FOUNDATION, an agency of the federal government, was created by Congress in 1950 to advance the progress of science. Its primary functions are supporting basic research, training and education in the sciences, and disseminating scientific information. The N.S.F. also studies scientific manpower supply and demand, and makes surveys of the national scientific research and development effort. The Foundation is governed by a 24 member National Science Board. Chairman is Detlev W. Bronk and director is Alan T. Waterman. Headquarters in Washington, D.C., are in the building formerly occupied by the Atomic Energy Commission (see photograph at right). In 1959, the Foundation awarded 3937 fellowships and sponsored 542 teacher institutes. It awarded 1809 grants totaling \$65 million for basic research in science, and for the construction and maintenance of research facilities such as the National Radio Astronomy Observatory in Green Bank, W. Va., the Kitt Peak National Observatory in Arizona, an oceanographic vessel, controlled environment biological laboratories, and nuclear reactors. The N.S.F. administers the U.S. Antarctic Research Program and is responsible for a program of research in weather modification.

policy concerning education in the sciences. Rather, the Foundation is, in effect, directed to lend assistance in identifying educational policy. Hence, the Foundation, a federal agency, serves all the people of the nation by serving in unique ways the scientific and educational community. It continually seeks appropriate means of bringing federal resources to bear on the task of helping that community better identify its policies, define its problems, and work toward solutions.

To do this, the Foundation must remain ever alert to the opinions of the scientific and educational community. So long as it is sensitive to informed opinion, it remains a sounding board with an ever-evolving function; it is a part of the educational scene and becomes, as it should, a working instrument of the educational system.

The Foundation has utilized a number of devices to make sure that it acts in full accord with those directly responsible for education in the sciences — scientists, teachers and educational administrators. Among these devices are: (1) clearing all policy matters pertaining to support of education in the sciences with the National Science Board (a governing board composed of 24 eminent scientists and educators); (2) seeking advice of advisory committees (some permanent and some temporary) on each facet of the various programs, and (3) seeking highly specific advice from competent scientists and science teachers on which of the many requests received

for support are the most promising and meritorious.

From this kind of valued consultation, several principles for action have emerged. Stated most simply these are: There is no substitute for excellence, and the Foundation must be concerned with the teaching of science at all levels; there is no simple, grand solution to the problems in science education — hence, a number of approaches are needed; finally, many individuals, groups and organizations are working toward the improvement of education, and the Foundation's programs must supplement, not compete with, their activities.

Activities are designed to improve education. Under the continual guidance of the scientific and educational community, the Foundation has developed a number of activities designed to improve education in the sciences. These activities are focused on the following basic areas: (1) the supplemental training of teachers of science, engineering and mathematics at all levels of the educational system, (2) improvement of the subject matter of science instruction, (3) identification and motivation of high-caliber students, and (4) financial support for further training for graduate students and advanced scholars. Discussion of the first three of these areas and the programmatic approaches may be of interest.

The supplemental training of teachers in the subject matter of science

and mathematics has been supported by the Foundation through three mechanisms: (1) institutes, which in 1960-61 will assist 30,000 teachers; (2) individual summer fellowships, and (3) research participation in scientific laboratories, the latter two having fewer participants than the institute programs.

INSTITUTES. Institute programs, in turn, are of three main types: summer institutes, which offer opportunities for full-time study in the summer; academic year institutes, which offer opportunities for full-time study for an entire school year and, in many cases, include a related summer program, and inservice institutes, which offer one or two courses to the teacher on Saturdays or during after-school hours. The courses of study available in each type of institute are especially designed to meet a teacher's needs. Total support for these programs during 1960-61 is about \$32.5 million.

The Foundation firmly believes that the nature of an individual institute should be determined by the college or university conducting it, with the Foundation assisting financially. The colleges and universities determine the type and level of institute suited to the kind of teacher (elementary, secondary, junior college or college) whom the college or university elects to serve. Some institutes present specialized new topics to teachers already equipped with advanced, up-to-date knowledge of the field; many others



treat the material of science and mathematics in special courses designed for experienced teachers whose knowledge of the subject matter is out of date.

A typical institute includes 30 or more teachers working closely with a staff of college or university professors in the study of biology, chemistry, physics, earth sciences, mathematics or some combination of these fields. Ample opportunity, both in class and out of class, is provided for informal contact among teachers and staff. Such intimate contact is also beneficial to the college faculty members, for it increases their knowledge of the problems of science and mathematics teaching at the secondary school level.

The institute's programs are publicized in a general way by national releases prepared by the Foundation. The detailed and specific information is prepared and circulated by each local institute staff. During the summer of 1960 there will be 376 summer institutes, supported by the National Science Foundation, to provide training for about 17,000 high school teachers and 500 elementary school teachers, as well as approximately 2200 college teachers, in virtually all science and mathematics subjects, for periods ranging from four to 12 weeks. Approximately 11 per cent of the secondary school teachers of science and mathematics will have an opportunity to study at a summer institute.

The teacher interested in attending a summer institute applies directly to

the university or college sponsoring the institute; the selection of participants is a responsibility of the local staff. If accepted, the participant may receive financial assistance including a stipend and dependency, travel and (in certain cases) book allowances. No tuition or fees are charged to the stipend holder. The availability of credits toward an advanced degree is variable according to the particular institute attended.

Teachers' interest in and acceptance of the institutes is indicated by the fact that for the summer of 1959 some 100,000 applications (representing applications for several programs) were received for approximately 17,000 placements. Some institutes received as many as 10 applications for each available opening.

Fund provides another year at college for 1500 teachers. During 1960-61 the Foundation will support 33 academic year institutes, collectively providing an opportunity for about 1500 high school teachers of science and mathematics (as well as about 45 college "teachers of teachers") to return to college for a year's full-time study. Many of these teachers will earn master's degrees during the year, and all will be prepared for more effective teaching performance in the classroom.

Experience indicates that nearly all of these teachers will return to the classroom, although some may change schools, and still others may return to

more responsible positions in their own school systems. Successful applicants receive a tax-free stipend and allowances averaging \$4300 for the academic year. Because their school systems benefit substantially from the teacher training, many local boards of education assist their teachers during this year of sabbatical study by augmenting the stipends provided. Others are able to assist financially those who are unable to obtain support from other sources. The academic year institutes program currently provides instruction for about 1 per cent of the nation's secondary school teachers of science and mathematics at a cost of approximately \$9.2 million.

Program supports 200 inservice institutes. The Foundation will support about 200 inservice institutes at a cost of \$2.2 million during 1960-61. This program is designed primarily to allow secondary school teachers of science and mathematics to take courses during their "off-duty" hours at institutions of higher learning located within commuting distance. These institutes will provide instruction to about 10,000 teachers, or 6 per cent of those eligible. A few experimental institutes of the inservice type will be conducted for elementary teachers and supervisors.

Financial support for assisting with the expenses for commuting and books is available, and the participants are not charged for tuition or instructional fees. As in all institute programs, each



TRAVELING science library lent by the National Science Foundation under a rotating plan provides elementary pupils with books on science and mathematics. The books are carefully selected by teachers and scientists, and are lent to elementary schools that do not have an adequate library for pupil use.

TRAVELING science teacher arrives at a school to give a science lecture-demonstration. These lectures, supported by the N.S.F., provide opportunities for secondary school students and teachers to witness programs in physics, chemistry, biology and mathematics. The lecturer is a specially trained high school teacher.

institution receives a grant covering the operational costs of the institute.

The institute mechanism is an approach to education which assures that what is taught and how it is taught are the responsibilities of the academic community, a device to recognize and support one of the basic elements of the strength of the American educational system. In addition to providing needed retraining for teachers and laymen, the institutes help to assure that the various levels of the academic community understand one another and work together, so that the entire structure of American education is strengthened.

The specific results of institute experience for the individual teacher and the students with whom he will work in the future are varied and difficult to assess. There have been many reports of the high level of interest and motivation displayed by participants, both during and after attending the institutes. Their genuine drive and enthusiasm strongly indicate that the institutes are very effective. The teachers also comment that, for the first time, many colleges and universities are providing courses in science and mathematics that are directly related to the conditions and problems of teaching at the precollege level. Seemingly a new tradition is being established with respect to the refresher training of teachers.

In the past few years the public and the educational community itself have indicated a high degree of acceptance of institute programs. The summer program was initiated in 1953 with two institutes and has been increased to 376 institutes for the summer of 1960. To date, some 50,000 stipends for teachers have been provided. The academic year institutes began in 1956-57 at two universities, and in 1960-61 this program will encompass 33 institutes, with approximately 5000 teachers benefiting by participation. The inservice institutes began in 1956-57 at two universities, and in 1960-61 will include more than 200 separate programs. By the end of the 1960-61 school year, almost 22,000 teachers will have been provided subject-matter courses.

To improve the level of teacher competence is a constant process. Three programs are in operation

Maintaining and improving the level of competence of the total corps of teachers is a constant process. Even well trained teachers cannot keep up with the rapid progress of science without periodic "refresher courses," and unless teachers know their subject matter, their effectiveness as teachers inevitably suffers. Consequently, there will be continuing need for study programs of the type now being offered through the institutes.

In addition to the institutes program, two newer programs that provide advanced training opportunities for teachers are now in operation. These are the summer fellowships for secondary school teachers and the program of research participation for teacher training. Each of these programs permits a number of teachers to spend summers participating in advanced scientific activity comparable to that pursued by graduate students preparing for careers as scientists and mathematicians.

SUMMER FELLOWSHIPS. The program of summer fellowships for secondary school teachers provides awards on a nationally competitive basis. The teacher-fellows may spend from one to three summers at an institution of their choice, studying subject matter in science or mathematics at the graduate level.

Applications for these awards are evaluated by special panels composed of academic scientists, and several hundred teacher-scholars are offered awards annually. After having been selected on a highly competitive basis, fellows are provided support comparable to that offered in summer institutes, but each fellow has the opportunity to undertake intensive training in the sciences in individually chosen programs of study. It is estimated that the cost of this program for 1960-61 will be \$1.3 million.

RESEARCH PARTICIPATION. Research participation for teacher training is a summer program that enables secondary school (and college) teachers to participate in research work with experienced college and university research scientists and mathematicians. Thus, teachers well informed in sub-

ject matter are actively engaged in their scientific specialties during the summer months. Such research activity enables these science teachers to broaden their scientific experiences, with resulting benefits to their instructing and guidance activities. The program for the summer of 1960 will provide support for about 550 participants at a total cost of \$1 million. Stipends and allowances are provided as in the summer institutes programs and no tuition or fees are charged the participants.

In addition, the Foundation encourages education in the sciences by supporting university sponsored special conferences and subject-matter workshops, as well as many experimental special projects designed by universities and colleges for the improvement of teacher training in mathematics and the sciences.

Improved course content reflects contemporary knowledge. It is evident that antiquated curriculums have no place in today's schools. Consequently, the course content improvement programs supported by the National Science Foundation represent promising efforts to design and develop curriculums and courses that reflect contemporary knowledge and points of view. Such programs, initiated and led by distinguished scientists, involve expert opinions from appropriate segments of the scientific and educational community, and are sponsored by colleges, universities and, occasionally, other appropriate organizations.

National in scope and applicability, the projects range from small-scale experiments to extensive projects. A given study may consider a single course or may span several courses, several disciplines, or more than one educational level. The Foundation's support is limited to the design and development of new course content and teaching aids, including suitable testing. Foundation funds are not used to promote the acceptance of any curriculum, course or instructional materials; once in being, these must gain acceptance on their intrinsic merits.

The improvement program of course content was initiated several years ago on a modest basis, with support granted for various experimental undertakings. Among these were conferences on high school physics and chemistry, a committee study of biological education at all levels, and development of a sourcebook of experiments and field studies for secondary school biology by a team of university biologists and high school teachers. Success in these ventures encouraged substantial expansion of the program.

Major support thus far has been directed toward high school courses. At this level the need was acute, and outstanding scientists undertook to meet it.

Four-year study of physical sciences nears completion. Of the major projects, the new approach to physics for high schools represents the first and best known. The *Physical Sciences Study Committee* has made possible the conduct of a cooperative study by a large group of leading research physicists, high school teachers, science writers, apparatus makers, film producers, and other qualified persons. Their knowledge, experience and talents are contributing to the development of a textbook, laboratory guide, and new apparatus, films to supplement classroom teaching, a teacher's guide, examinations, and a series of inexpensive books for supplementary reading.

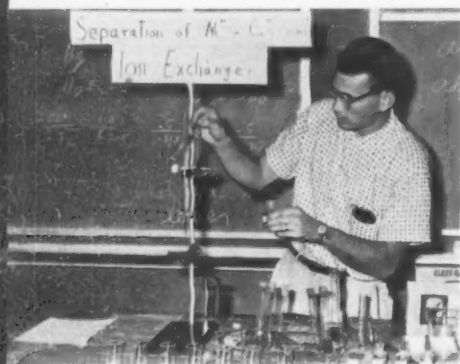
After several revisions based on extensive school trials, the material will become generally available in the fall of 1960. This four-year effort may have a far-reaching impact upon the teaching of physics, and it has already encouraged scholars in other disciplines to initiate comparable efforts.

Study groups conduct program for improving teaching of mathematics. In 1958 the *School Mathematics Study Group* was organized to carry out an extensive program for the improvement of mathematics teaching in elementary and secondary schools. Many of the country's most eminent mathematicians and accomplished

teachers in private and public schools are now engaged in this endeavor. Writing teams have produced preliminary versions of "sample" textbooks and commentaries for teachers of Grades 7 through 12.

After a revision based on trial in some 400 classrooms, the sample materials will be made generally available for a limited number of years as sources for authors developing new textbooks, as aids in teacher education, and for interim use in schools. This study group is also preparing supplementary books on special topics and developing background materials for teachers.

Two groups seek improvement of chemistry courses. As a Foundation supported chemistry project, the *Chemical Bond Approach Project* represents the efforts of a group of college and university chemists and high school teachers in devising a high school chemistry course that uses the concept of chemical bonding as the central theme. Preliminary versions of text and laboratory materials prepared by this group are now being tested in classrooms.



ION exchange separation of cobalt and nickel ions is demonstrated by Ronald H. Engebrecht, a student at the Academic Year Institute of the University of Michigan.

Teams develop new courses in biology. Development of new high school courses in biology has been undertaken by the Biological Sciences Curriculum Study. This, too, is a co-operative effort. Some teams are developing basic content; others, laboratory studies designed to give realistic experience in investigation; others, special reviews for teachers; still others, programs for the gifted.

Geologists prepare instructional aids for earth sciences. For the earth sciences, geologists and teachers have developed source books of units for students, background materials for teachers, laboratory and field studies, and other educational aids. Designed for use in elementary and secondary school science courses, the books will be issued by the end of 1960.

A separate but related effort has been the development of a report on general guidelines to assist schools in changing their curriculums. This report concerning Grades 7 through 12 will complement an earlier report on elementary school science, distributed to many school administrators.

The Foundation is now giving increased attention to mathematics and science for elementary and junior high schools. Several curriculum groups are developing content for these levels, and other exploratory projects are in progress. In California, scientists representing a number of fields are working with teachers in selected school systems to define important content and develop materials for teachers and pupils of Grades 1 through 6. Others are experimenting with the introduction of topics from geometry and other scientific areas in the first six grades.

Program recognizes importance of A-V aids and laboratory equipment. It is recognized that films, television and new types of laboratory equipment have tremendous potentialities for improving the effectiveness of science and mathematics teaching. The Foundation supports some efforts in this connection. Also, the improvement of college curriculums is supported. Grants have been made for studies in physics, chemistry, anthropology, psychology, civil and chemical engineering, and other fields at the college level. These projects will have definite implications for the schools, as they are related to improved courses in elementary and secondary schools and as they affect teacher education.

The Foundation's programs that directly support science education for the student have as their objectives the development and maintenance of a reservoir of scientific manpower adequate to the nation's needs. If these objectives are to be met, it is essential that all elementary and secondary

school students be properly trained in science, guided toward a meaningful understanding of science, and made aware of the opportunities and rewards of careers in science and technology. Further, it is necessary that the unusually able secondary school students who are especially interested in science be encouraged to advance in their science education as rapidly and as far as their intellectual capacities permit. The programs for secondary school students are designed to achieve these purposes.

It has been recognized that the science-motivated secondary school student can further his education through extracurricular as well as curricular activities. Various programs conducted under N.S.F. support are directed toward increasing this kind of opportunity.

Summer science training is offered academically talented. The largest of the programs for academically talented high school students is one that provides for summer science training. Under this program, grants made to colleges, universities and research institutions permit them to offer special science education programs in their classrooms and laboratories during the summer. Initiated on a national basis during the summer of 1959, this program was represented by 116 institutions offering training in which about 6200 students participated during the first year. Clearly the number of students served by these programs was only a small fraction of those students equipped to profit by them. For the nation as a whole, one out of every four applicants was accepted, after being subjected to careful screening. One Eastern university received a total of 1648 applications for only 50 openings.

A wide range of educational experiences was provided among the 116 summer science training programs. Included were advanced science courses, participation in research, special field trips, visits to scientific laboratories, and special orientation lectures. In addition to the college and university faculty members and research workers involved, about 360 secondary school teachers were included on the staffs conducting these programs. This activity will be continued during the summer of 1960 at about the same level as during the summer of 1959.

Several student science organizations are supported. As a part of its effort to encourage extracurricular science education, the Foundation also supports the national activities of several student science organizations. Since 1952 the Foundation has been providing limited support to Science Clubs of America, administered by Science Service, Inc., a nonprofit organization with other sources of income. Among the many activities of Science Service, Inc. carried out (in part) with Foundation support have been the National Science Fair and the preparation of books and pamphlets for the guidance of students in the development of science projects.

Another organization whose national student science work is being supported in part by the Foundation is the Junior Engineering Technical Society. Through grants made to a number of state and local academies of science, stimulating extracurricular science activities have been provided by junior academies of science.

In addition to supporting extracurricular science student programs, the Foundation has supported a number of undertakings designed to aid high schools in achieving their objectives in science education. Programs that provide for cooperation between a college or university and several local school systems in the development of advanced placement courses in science and mathematics for intellectually gifted students are being fostered in several areas of the country.

The American public school system has set a standard for the whole world in mass education. In achieving its goals in this area, the American secondary school has not always been able to meet the special needs of the intellectually gifted. Since this is the group from which our most creative scientists are likely to emerge, the National Science Foundation is deeply interested in assisting colleges and universities in the development of programs which meet the needs of such students.

Career guidance receives grants. School counselors face the difficult task of acquainting the students under their guidance with the many career opportunities available today. To assure that these counselors — and science teachers — are supplied with adequate information on careers in sci-

ence, mathematics and technology, the Foundation makes grants to professional scientific and engineering societies for the preparation of career guidance materials in the various scientific and technological disciplines. Career information booklets have been prepared by leading scientists, mathematicians and engineers under sponsorship of professional societies.

Foundation-sponsored projects for the secondary school student is the Traveling Science Library. The primary objective of this project is to stimulate the interest of high school students in science and mathematics through making available to schools, on a loan basis, a carefully selected library of general interest books covering a broad spectrum of science fields. This

The National Science Foundation sends outstanding scientists to visit secondary schools. Its traveling libraries serve both elementary and secondary schools.

Scientists visit secondary schools.

As a means of fostering direct communication between the scientific community and the high school student, a national program of visiting scientists has been developed in cooperation with the professional scientific and technological societies. This program provides for the visits of outstanding scientists to secondary schools for the purpose of acquainting students and faculty with the sciences as vital activities and providing counsel concerning careers and science education.

During the academic year 1958-59 a total of 165 scientists visited 550 high schools, speaking before an estimated total audience of 180,000. Under the present academic year program a total of about 300 scientists will visit approximately 1200 high schools, speaking before an estimated audience of 400,000. In addition to this visiting scientists program conducted by the national professional societies, more than 2000 visits of scientists to high schools will be made under the auspices of the Foundation's State Academies of Science Program.

Traveling libraries serve both elementary and secondary schools. One of the most rewarding of the many

project has been conducted by the American Association for the Advancement of Science since 1955 under funds provided by the Foundation. During 1958-59 a total of 375 sets of 200 books each were circulated to 1309 high schools and preparatory schools. This project is being continued during the present academic year. In addition, for the first time, a traveling science library for elementary school use is being developed this year.

An auxiliary service of this project is the publication of the following book lists: (1) the Traveling High School Science Library, an annotated bibliography of the 200 titles currently in use in this library; (2) an Inexpensive Science Library, a list of paperboard science and mathematics books, and (3) the A.A.A.S. Science Book List, containing over a thousand annotated titles.

Mindful of the fact that the improvement of education in the sciences must come from within the scientific and educational community, the Foundation consistently supports proposals and projects that have been developed within this community. The initial results of these efforts are most encouraging — but only posterity can render a final judgment. ■

EXPRESSING OUR GRATITUDE

LITERALLY hundreds of experts have participated in the preparation of this comprehensive administration study on science education (pp. 65 through 110).

ONE PHASE of this administration study is a special survey of outstanding practices and trends in the teaching of science in both secondary and elementary schools. This dual survey was made possible by the many administrators and teachers who provided the wealth of data from which the two summaries (p. 77 and p. 91) have been prepared. (*See list below.*)

VALUABLE INFORMATION was received from many industrial sources. We especially wish to thank the Scientific Apparatus Makers Association, through whose staff most of the contacts were made for the article on apparatus (p. 100). James R. Irving, executive secretary of the laboratory equipment section, graciously permitted publication of the survey on planning principles and provided other valuable information and counsel.

TO THE NATIONAL SCIENCE FOUNDATION and the members of its staff who con-

ferred with the editor, *The Nation's Schools* also is deeply grateful. The article on pages 69 through 75 was prepared by staff members of the Foundation.

TO THE U.S. OFFICE OF EDUCATION and to Charles L. Koelsche we express special thanks for permission to summarize a seven-state study of science education.

WE WERE FORTUNATE to have the services of John Sternig of Glencoe, Ill., curriculum specialist and authority on science education, as our special consultant. Mr. Sternig also compiled and interpreted the survey for the elementary grades.

OF COURSE, we are deeply grateful to the authors of the signed articles: Robert H. Carleton and his associate, John W. Renner, of the National Science Teachers Association; John Mayor, director of education of the American Association for the Advancement of Science; Elbert P. Little, representing the Physical Science Study Committee; Supt. Ernest W. Campbell of Seattle and his assistant for science education, Lyle Watson, and to our own audiovisual consultant, Walter A. Wittich. — A.H.R.

DURING the early planning stages of this study, the National Science Teachers Association was invited to offer suggestions regarding scope and content. Upon invitation, 15 N.S.T.A. leaders provided facts and ideas. Their suggestions were of special value in framing the two comprehensive questionnaires covering practices and trends. For this help *The Nation's Schools* expresses appreciation to:

DONALD C. DECKER, president, National Science Teachers Association; PAUL DeH. HURD, associate professor, Stanford University; RALPH E. KEIRSTEAD, consultant in science education, Connecticut State Department of Education; VERLIN W. LEE, assistant professor of science, Iowa State Teachers College; ELMER W. McDAID, director of exact sciences, Detroit public schools; J. STANLEY MARSHALL, professor of science education, Florida State University; MILTON O. PELLA, professor of education, University of Wisconsin; HAROLD PLUIMER, science consultant, Minnesota State Department of Education; JOHN S. READ, college of education, Utah State University; J. R. RICHARDSON, Ohio State University; SAMUEL SCHENBERG, director of science, New York City Board of Education; WAYNE TAYLOR, assistant director, Extension Teaching and Field Service Bureau, University of Texas; ORVAL L. ULRY, director, summer school, University of Maryland; STANLEY E. WILLIAMSON, chairman, department of science education, Oregon State College, and chairman, administrative committee, Future Scientists of America Foundation of the N.S.T.A.; W. W. WYATT, professor of education, University of Tennessee.

DISTRICTS participating: ALABAMA: Montgomery. ARIZONA: Mesa. CALIFORNIA: Oakland, San Francisco, Santa Barbara, Stockton. COLORADO: Boulder (District No. 3), Denver, Greeley (District No. 6), Jefferson County. CONNECTICUT: Hamden, Rockville, Westport. DISTRICT OF COLUMBIA: Washington. ILLINOIS: Maine Township, Evanston Township, Hinsdale (District No. 86), Oak Park (District No. 97), Winnetka (District No. 36). INDIANA: Evansville. IOWA: Des Moines. KENTUCKY: Louisville. LOUISIANA: Lake Charles. MARYLAND: Hagerstown (Washington County), Rockville (Montgomery County). MASSACHUSETTS: Lexington. MICHIGAN: Dearborn, Detroit, Midland. MINNESOTA: Minneapolis. MISSISSIPPI: Meridian. MISSOURI: St. Louis. MONTANA: Butte. NEBRASKA: Omaha. NEVADA: Reno. NEW HAMPSHIRE: Concord, NEW JERSEY: Elizabeth. NEW MEXICO: Santa Fe. NEW YORK: Mamaroneck, Rochester. NORTH CAROLINA: Durham. NORTH DAKOTA: Valley City. OHIO: Akron, Cleveland, Columbus. OKLAHOMA: Norman (Cleveland County). OREGON: Beaverton. PENNSYLVANIA: Philadelphia, Pittsburgh, Willow Grove. RHODE ISLAND: Providence. SOUTH CAROLINA: Greenville. SOUTH DAKOTA: Sioux Falls. TEXAS: Austin, Dallas. UTAH: Salt Lake City. VERMONT: Rutland. VIRGINIA: Portsmouth. WASHINGTON: Spokane. WEST VIRGINIA: Morgantown (Monongalia County). WYOMING: Laramie.

PAIRS of physics students do an experiment on Archimedes' principle at Beaumont High School in St. Louis. The weight of an object in water is compared with its weight in air. Students thus learn basic physical principles and gain practice in setting up equipment and using measuring devices.



SENIOR HIGH SCHOOLS

in 57 districts and 38 states report outstanding practices and significant trends in the teaching of the sciences

A NATION'S SCHOOLS SURVEY

Compiled by Leo E. Buehring

What changes have taken place in the senior high school science curriculum in the last five years?

The changes are mostly in subject emphasis rather than in the development of new courses. The theoretical approach to subject matter is being stressed, as opposed to applied science exercises. Better guidance facilities are being made available.

Words and phrases that not too many years ago were foreign to public high school science courses are being used today with increasing frequency. Some of these are: nucleonics, radioactive isotopes, reactors and nuclear energy, molecular and atomic structure, ionization and ionic equations, and the quantum theory. Aerospace science is receiving much attention, including the kinetic theory and principles of physics associated with flight. Air-powered jets, rockets and satellites are subjects of exploration,

as are the principles and operation of electronic space instruments.

In the biology curriculum attention is given to biochemistry, radiation biology, and microbiology. Students are introduced to the use and limitations of wonder drugs and some background is developed in blood typing and genetics. Instruction with reference to atomic fallout is given.

Chemistry studies are more closely related to the human body and its processes, including a study of cell structure. An effort is made to blend basic understanding of principles with applications.

In physics there is a deeper probing into electronics and emphasis on theory and Newton's laws of motion.

Other subjects mentioned include: sex education, mental hygiene, alcohol and narcotics education, developments behind expanding populations. More attention is being given to astronomy. The history of science and the lives of scientists are being reviewed.

What science topics have you deleted, minimized or reorganized in the last five years?

Respondents indicate that today there is *less* emphasis in high schools on historical science and on such purely practical items as how to make soap or how to build a radio.

General science courses of the survey type are being offered less frequently, in the freshman year the beginning course often being biology. In the upper grades there is increasing emphasis on the physical sciences.

In biology, rote learning has been replaced by the study of relationships between major principles. In physics, certain phases of mechanics, heat, metals, weather and conservation have been deleted on the assumption that these were treated adequately in junior high school. Such simple applications of science as the steam engine have been relegated from physics courses to lower grade general science.

Other subjects eliminated are: the mechanics of automobiles and television sets, and purely descriptive phases of chemistry and biology. Formal notebooks and workbooks are fewer. In areas in which practical applications of textiles and agriculture formerly were stressed, these are being minimized, as also are health topics, botany, zoology, learning classifications, and organizational schemes.

Have some of your science courses been reorganized, or subjects fused or integrated?

In one school in **San Francisco** class discussion sections using English and biology combinations have been developed. Commonly, science and mathematics have been more closely related, particularly in the advanced courses.

Experiments are being conducted in teaching larger groups, usually with the aid of educational television and other audio-visual materials. The most common sequence appears to be biology, chemistry and physics, often beginning with the ninth grade and leaving the 12th grade for advanced work.

A step in the direction of giving all science courses a laboratory approach is evident. In **St. Louis**, an experimental program which integrates mathematics and physical sciences at the ninth grade is based on teacher planning sessions with a professor at Washington University. New curriculum guides have been prepared.

Have you lengthened your science class periods or introduced a longer school day?

It is evident from the survey that high school people want more time for science classes, especially since an appreciable portion of the class period is needed for the setting up and taking down of science equipment, but no general solution of this problem has been offered. One school has lengthened its physics classes to 75 minutes daily, but most science classes seem to conform to a pattern of less than 60 minutes.

Some schools have introduced a seventh period, frequently for laboratory work, as at **Mesa, Ariz.**, but in most instances this additional attendance is optional. Some per-

mit students to devote their homeroom or other study periods to laboratory work. Experimental programs with longer periods are being conducted with the cooperation of local institutions of high learning, as in **San Marcos, Calif.**, in cooperation with Stanford University. Others have introduced double period laboratory work.

In **St. Louis** two 90 minute periods a week are devoted to laboratory work in chemistry, physics, biology and physiography, and three 45 minute periods to lectures, discussion, films, slides and feature demonstrations.

Do you provide additional learning opportunities for high school students with special talents in science, such as: science clubs, Saturday classes, evening classes, and special trips?

Almost every school system sampled reports having science clubs in operation, ranging from biology and chemistry to radio and photography. Special field trips are a regular part of the science programs of most schools. Evening classes are the exception, and Saturday classes are relatively few in number except for those offered at local colleges or universities. Some systems provide additional opportunity for the talented in science during the summer months. **Lake Charles, La.**, has introduced a 10th month for a selected group of learners.

Science Clubs. These usually meet after school, although in one system 45 minutes is allowed for this during the noon hour and in another school students meet voluntarily one hour before classes, one day a week for "experience sessions." Club sponsors ordinarily are teachers, usually serving without additional pay. The work is done as an extracurricular activity, usually with no cost to the student, although some clubs have nominal dues to cover field trips and film rental expenses. Funds to cover the cost of speakers and materials are raised in some localities by various outside projects. Many speakers meet with clubs without expecting compensation. In one community a weekly seminar headed by scientists from local industry was tried for a year but was replaced by seminar discussions led by students, meeting three periods a week. Occasionally science people from the community are invited to visit and discuss matters with the group.

Field Trips. Special trips are conducted both on school time and after school hours and on Saturdays by teachers and/or local sponsors. Places visited vary widely, ranging from the local creamery and utility to the observatory in a near-by community. Local or near-by museums and the research departments of colleges and industry are common destinations.

In **Mesa, Ariz.**, a traveling science institute serves the schools at no cost to the district, utilizing the existing personnel and facilities. Others points visited by science classes include a local microwave outlet, refineries, smelters, mines, and botanical and zoological gardens. Also, there are collection trips for geology and botanical specimens. Groups often are made up of students from the various high schools who have shown outstanding ability and interest. In the case of longer trips the student may be asked to pay his own transportation expenses, but some schools set aside a small budget for this purpose.

Improved results in some of the communities are obtained by arranging meetings well ahead of the trips for preliminary discussions and orientation.

Saturday Classes. Apparently because of the transportation problems involved, Saturday sessions do not seem to be a common method of providing additional learning opportunities for high school students gifted in science. Local universities in some areas provide special courses (some with advance placement credit) as do various private organizations, such as botanical societies and the National Academy of Sciences in Washington D.C. Some talented students work closely with professors of local colleges and universities on individual science projects.

Evening Classes. Some experimentation has been done with evening meetings at instructors' homes to which a limited number of students are invited to engage in informal discussions. The results are impressive. In some instances scientists from local industry guide students in original research projects conducted in industrial laboratories. One system offers a TV series in radio biology during out-of-school hours with teachers reviewing work sent in on a study plan basis. **San Francisco's** Lux Laboratory at Calileo High School is a prime example of an after-school program.

Summer Classes. Summer sessions for the gifted high school student cover meteorology, geology, atomic physics, astronomy and radiation biology. For these courses, as for the limited number of Saturday courses reported, a charge usually is made and teachers are paid for their work. In one school a creative science course permits students to work on their own projects at a nominal cost of \$12 a student. Some students also are taking advantage of the science career program of the National Academy of Sciences, which enables students to do research work under the individual sponsorship of prominent scientists in industry and in universities.

Other schools offer enrichment work within the framework of the regular school schedule.

As a general policy, do you favor the laboratory approach in the teaching of chemistry, physics and biology, as compared to a more generalized type of instruction in which films, slides and teacher demonstrations are utilized?

Only one respondent cast an outright "no" in answering this question. All others declared themselves as favoring a laboratory approach, although many emphasized that this did not mean that either method should be mutually exclusive.

Designating this inquiry as "a loaded question," one respondent voiced a common agreement: There is no "one best way to teach science. All of these approaches must be tried."

Other respondents endorsed this point of view as follows: "We use all approaches. Different people have different strengths." . . . "All avenues must be used. Some activities are presented best by demonstrations. We hope the audio-visual aid will induce the student to follow through with some activity on his own." . . . "Favor a balanced combina-

tion of the two methods." . . . "It is our philosophy that the lecture demonstration is essential, but a laboratory experience makes the principle being discussed lasting. It is a wonderful means of motivation for learning." . . . "We need both approaches, but certainly more laboratory science generally. Pupils learn the 'experimental methods' of science best through laboratory exercises."

There were also these evaluations: Students need kinesthetic appeal as well as audio and visual." . . . "We use films if they can do the job better, but part of the school day must be used for active pupil participation." . . . "Usually films and slides are subject centered, rather than behavior centered, making the student take the role of passive recipient of facts rather than an active learner whose behavior, technics and thinking are changed. Good teacher demonstrations, however, are conducive to developing the kind of growth we desire."

While science supervisors expressed themselves in favor of a balanced combination of the laboratory and demonstration methods, their replies do not necessarily indicate that either method alone or in combination is being followed presently to their satisfaction because of limitations of space, time and finances. Rather the comments indicate goals toward which these high school science educa-

IDENTIFYING MUSHROOMS is the assignment for this biology class at Lewis and Clark High School, Spokane.



tors are striving. One said: "Cost limits the laboratory approach, class size and teachers also affected by cost."

In the utilization of closed-circuit television in the teaching of science, three interesting developments are reported by Evanston Township High School in Evanston, Ill.:

1. *Magnification of Dissection:* Teacher, camera and receivers are all in the laboratory with the students. The teacher operates the camera while students watch a frog dissection blown up to 21 inches on their receivers.

(Continued on Page 80)

2. *Microscope Study*: The camera is attached directly to the microscope to enable the teacher to show students in 21 inch pictures what they ought to be seeing in their own microscopes. This has been most effective for teaching beginners how to adjust the microscope correctly.

3. *Team Teaching*: One instructor presents a demonstration via television to two laboratories, thus freeing the other teacher to circulate among the laboratory stations to assist individual students.

Seattle public schools work in several areas of television programing.

The general viewing public is acquainted with school problems by being shown classes in progress. School programs are correlated with classroom activity as part of the regular school day. Teacher education programs provide special training, with some carrying professional credit. Administrative programs are planned to be of general interest to the professional staff of the entire school system.

When a specialist in any phase of curriculum is visiting the school, kinescopes are made for use at future times, either in professional class or directly by the department head involved. In all of these programs science education receives its share of attention.

Does your high school conduct science fairs? What are the advantages or disadvantages?

With negligible exceptions, the reporting districts conduct science fairs in at least some of their schools, or participate in regional and other science fair projects. In some instances, the community fairs serve as screening devices for regional science exhibitions.

Just about every respondent has something favorable to say regarding science fairs, although most are aware of the

difficulties and shortcomings inherent in this type of program. Among the *advantages* listed are the following:

Science fairs are incentive devices, creating interest in science courses for both student and public. They can provide excellent motivation for out-of-class study and more intensive and extensive participation in creative work. Younger students see the exhibits and become interested in enrolling in science courses.

Gifted students are stimulated by science fairs to apply scientific principles and to use scientific methods, as well as to utilize the resources of the community. Competition with others academically is thought to give stature to academic ability. Opportunity for student experimentation is provided, along with a chance to explore special interests, and to express individual ideas and differences. For those qualified, an opportunity is provided to do independent research and original work, and to make contact with professionals in the field. For the school an opportunity is provided to tell the story of the school's K-12 science program and to create a broader interest on the part of citizens.

Among the *disadvantages* of science fairs (listed in most instances by the same persons who stated the advantages) are the following:

Dishonesty can be encouraged; too many projects are done by parents or with too much help by other persons, with the student receiving credit for work he did not do. The number of entrants has become too large and projects are poor and repetitious; copy projects defeat the objectives of a science fair.

Some believe that too much emphasis is placed on the mechanics of preparing an exhibit rather than on true scientific value. The display is likely to be artistic rather than scientific and to lean toward kits rather than originality and learning experiences.

Exhibits cost money, and students from low income groups cannot compete fairly with students from higher income brackets. Too often fair participation is a novelty that soon wears off; interest stimulated is not sustained until the next fair. Spur-of-the-moment activities may follow cookbook type instruction, which has little scientific value. On the other extreme is the student who attempts a project that lies outside and above his scientific background.

Perhaps the most frequently mentioned danger, even by those who plan to continue their science fairs, is that the students spend too much time on "projects," and too little time on homework. Also, a tremendous amount of time is added to the teachers' load after school hours, with the event becoming the public relations focal point for the instructional program in general, thus losing its true purpose. Because of the time required, other basic activities may suffer, and the fair may interfere with regular class work. Too much class time taken up with projects lowers the level of class work. Some find the work of scoring, judging and the competitive situation of real concern.

What other changes have you made in organization of courses?

Ability grouping in high school science courses seems to be increasing, and this automatically has led to some course changes. Independent Community School District in Des Moines, Iowa, has special groupings for the less



SCIENCE FAIR display is the center of interest for these students in Omaha. The purpose of the fair is to tell "the science story" and to interpret the K-12 science program.

able as well as for the talented. Several schools are preparing for advance placement courses in biology, physics, chemistry, and some schools, Akron, Ohio, for example, have such programs under way, with at least one system using a freshman college text in this connection. Science fairs are mentioned by various school systems as outlets for additional learning opportunities for students with special talents in science. At Sioux Falls, S.D., science research classes have been added.

Do you differentiate in science courses offered students who are not going to college as compared with those who are preparing for college?

About 30 per cent of the sampling indicates no administrative differentiation made in science courses, although some of the replies are qualified. Those districts reporting differentiation most frequently appear to be doing so within the framework of regular classes, rather than in classes labeled specifically as college preparatory.

Differentiation in science courses as between the college bound and students not aspiring to further study would appear to take four basic forms:

1. **Curriculum Content.** Courses are set up specifically for those not intending to pursue their education after graduation from high school, including special courses for the slow learner.

2. **Counseling.** Students known not to be qualified for courses in chemistry and physics are advised not to enroll; gifted students qualified to take the more difficult work are not permitted to register for "easy" classes. On the basis of advice received, students tend to eliminate themselves from courses with requirements beyond or below their abilities, and tend to group themselves within such courses as they do take.

3. **Prerequisites.** Enrollment requirements automatically tend to eliminate nonqualified and inadequately prepared students. In Morgantown, W. Va., slow learners are not admitted to chemistry and physics classes, decisions being reached on the basis of performance in homogeneous grouping at the junior high level. In Laramie, Wyo., chemistry and physics are college preparatory only (with biology remaining general).

4. **Grouping.** Most differentiation appears to be achieved by ability grouping systems of various types. Under this plan the college bound frequently find themselves together in the same classes. At the higher levels there is a more active approach, and a higher degree of accomplishment is expected. Grouping by ability results in corresponding levels of subject difficulty, with better results demanded. Even within these classes teachers give a slant to their instruction with an eye to those preparing for college.

In schools with a large percentage of college preparatory students, increased emphasis is on subject theory. Maximum accomplishment is expected of college preparatory students with lower standards exacted of others.

Further differentiation is achieved by permitting future college students to enroll for biology in the ninth grade in those schools where the regular curriculum suspends biology until the 10th grade. This leaves the senior high year free for an advanced science course.

What is your policy with regard to the amount and nature of mathematics required prior to a student's enrollment in science classes?

For biology and general science there seem to be no mathematical prerequisites aside from those required of all students for graduation. Even in the other sciences, actual



FISH are not color blind is the finding of Ricky Matsen, sophomore at Stephen F. Austin High School and a winner of "Best of Show" in the Austin District science fair in Texas. He found that fish recognize blue more easily than red and have a memory of at least one week.

practice seems to be more the result of personal counseling of students and their understanding of the need for a mathematical background before enrolling in science courses. The usual minimum pattern appears to be one year of mathematics for chemistry and two years for physics, with additional courses recommended.

Those preparing for college usually have their work in mathematics more definitely prescribed, and students in accelerated classes are expected to take advanced work in mathematics before or concurrently with their enrollment in science classes. Thus by the time of graduation they will have an advanced standing in mathematics as well as in the science courses.

Prerequisite to enrollment in **chemistry** courses most frequently is one year of algebra, although some schools require a year of plane geometry in addition. Whether there are requirements or not, schools make specific recommendations as to the courses in mathematics that should be taken by science students, ranging all the way up to two years of algebra, with geometry recommended.

For **physics** prerequisites in mathematics are set forth more specifically, although even here the samplings re-

ceived suggest wide variations in requirements. Included are the following: one year of algebra and one year of geometry; one year of algebra and two years of geometry; two years of algebra; two years of algebra and one year of geometry; two years of algebra, with geometry recommended; one year of algebra with one year of geometry, and one year of trigonometry recommended.

Do any of your students do part-time work in hospital laboratories or other science facilities in the community? If so, are they paid for this work? Do they receive credit?

High school students with limited experience in this field do not seem to have much opportunity to find employment in local laboratories, as do business education students in local business establishments. Not only are they not far

Photo by Polytechnic High School photography class, San Francisco



INTERESTED elementary school pupils from around San Francisco learn the mysteries of chemistry at the after-school Lux Laboratory at Polytechnic High School. The classes have since moved to Galileo High School.

enough advanced in their studies to do the types of work available, but local employment situations, including union regulations, at times make this impossible.

Nevertheless, almost half of the respondents report that some students do find some employment in related fields, usually on their own initiative and responsibility, without help from any formal school placement program. Such employment is after school hours and in the summer.

When students are employed, they receive payment, but no academic credit is given for this experience. In a few instances, students are employed by the school system as laboratory assistants to science teachers, but in only one such instance was credit reported, this amounting to one-fifth point credit per term.

Is there an imbalance in high school science offerings compared with the total curriculum? If so, how would you correct it?

Since the questionnaire usually was answered by the head of the science department, there was not anticipated any great outpouring of complaints that science courses today constitute too large a percentage of the total high school program. Thus it is not surprising that four out of five respondents report "no imbalance," and that such imbalance as is recognized by the others pertains to situations within the high school science department itself, or in its relation to the junior high and elementary school offerings.

One respondent reports that in his district both history and English are required for four years, so that many top students can take only one science course in four years. He would require the top students to take five subjects a year, one of which would be a science for each of the four years. He would require at least eight periods of laboratory science a week instead of the present five. Another respondent opines that perhaps so much national emphasis has been placed on science that it has encouraged enrollment of pupils who really are better suited, or more needed, in other areas of academic work.

As to any balancing needed within high school science departments the following suggestions were made:

More depth is needed in advanced science courses, and more physical sciences should be taken by noncollege entrance students. Some advocate that more advanced courses in science should be added at the senior level for the gifted.

Do you have special classes or a modified curriculum program to facilitate the teaching of science subjects to slow learners?

About 17 per cent of schools included in the sampling replied "no" to this question. Of the 83 per cent reporting "yes," just short of one-third reported meeting the situation with various forms of grouping. About half of the latter courses are organized in keeping with two-year and three-year track systems.

While students of poor ability in science and slow learners in general usually do not elect science courses beyond the minimum requirements, nevertheless most schools appear to be making an effort to provide these students with at least a sufficient science background for daily living.

Some schools in **Montgomery, Ala.**, offer a one-year physical science course for students who have failed in chemistry. An applied science course is taught in the **San Francisco Unified School District**. **Boulder, Colo.**, has a special physical science class that covers both physics and chemistry in one year. Independent Community School District of **Des Moines, Iowa**, utilizes textbooks of a less difficult reading level for slow learner classes. Schools in **Hagerstown, Md.**, teach science in the ninth grade, five days a week, with the aid of 30 minute TV presentations, followed by 25 minute regular science classes grouped homogeneously.

In addition to various modified courses in biology, general science, and physical science, such titles as the following appear: life science, introductory general biology in-

cluding basic physiology, economic biology, home science (physical science for girls), and remedial science. Instruction is offered well into Grade 12, slow learners being exposed to courses with modified content at a somewhat later grade level than those in regular classes. No attempt is made to teach the entire usual science curriculum content in some of these classes. Certain of the slow learner courses include a simplified laboratory approach, with less accent on theory, as in Union High School District No. 10 Joint, Beaverton, Ore.

In the Cleveland schools special topics are designated for the less gifted pupils in the curriculum guides, and a recommended reading list for these students is provided. Some respondents object to grouping because they believe that slower learners are deprived of the stimulation of oral class discussion by the more able students; they attempt to meet the needs of special problem students within the regular class by means of supervised study periods and personal assistance.

Reading difficulty experienced frequently by slow learners is counteracted at Spokane by using a great deal of audio-visual material that is intended to aid students in understanding better what they are reading in a textbook.

Physical science courses at the 10th year level appear to meet the need of slow learners at Evansville, Ind., where the science teachers make the usual adjustments for the slow learner within the framework of the regular classes. At Omaha special classes in biology were tried, but dropped.

Selection of students for physics and chemistry classes on the basis of mathematics background also results in bringing together in science classes those who have experienced difficulty with their mathematical subjects.

In one way or another other schools retain science as part of their modified program in special education.

By what methods and contacts are you upgrading the competency of your science teachers?

Almost every respondent uses college and university work as one method. About 20 per cent add summer and evening institutes and lectures, conducted in many instances by college faculty members. Some institutes are identified specifically with the N.S.F. program.

About two-thirds of the study participants utilize workshops. More than that number use the services of outside consultants, and one-half rely on science specialists on the district's own staff. The fact that about every other district in the sampling reports audio-visual media as one of the upgrading technics may be credited to the national science program telecast during the past year. Demonstrations by specialists on how to present science material effectively are benefiting inexperienced teachers in numerous cases.

Other methods include the following: own inservice program, department meetings, and seminars; conventions and other meetings; tours of industry. Audubon camps and botanical gardens; teacher science club field trips, visits to other classes and other schools. Providing a departmental science library and making professional literature readily available to teachers is another means of encouraging professional development.

Do you offer any other motivation for science teachers, such as relief from other duties?

Almost half of the department heads say they have no regular plan for motivating science teachers, or did not answer the question. Just short of half of those responding indicate that time off is allowed for conventions, seminars and other conferences. A few systems report helping teachers defray convention expense, and others emphasize that during their absence a technically trained substitute teacher is provided by the school. Attendance at meetings in some instances is restricted to specified gatherings.

One out of seven districts encourages science teachers to try for scholarships and fellowships, including the National Science Foundation fellowships. One out of eight schools excuses science teachers from other duties, at least on certain occasions. Extra pay for science teaching is mentioned in only two instances, and one of these involves after-school time devoted to a laboratory program.

Other actions taken to motivate science teachers, mentioned once each, are: staff employment during the summer sessions, curriculum credit on an advanced salary schedule for curriculum revision work, decreased load for accelerated classes, publicity on outstanding achievements, time allowances for visitation and conferences in local industry, provision of materials for special interests.

Do you provide your science teachers with non-certified help, such as student teachers or laboratory assistants, and clerical aid?

Results of the sampling show that, by and large, science instructors run their own show without organized assistance. About one-third of the respondents failed to answer this question or said that no assistance is provided.

More than half of the others report some student assistance, but this usually is nonpaid help, often qualified to give only limited assistance. Seniors personally interested in science and a teaching career are said to be the most helpful as laboratory assistants.

More than half of the respondents who answered this question also indicate that student teachers from near-by colleges are assigned to their classes at least periodically, if not regularly, but as one director of instruction explains: "They cannot give much relief to teachers, as they themselves need a great deal of teacher time to do a good job." With various degrees of emphasis, others doubt that student interns can be considered helpful, except for cadet teachers.

In one district science classes are organized so that students take their turn at helping the teacher set up equipment. One teacher has a storeroom assistant and another has the benefit of a student projector operator.

One out of each six districts reports that clerical help is available on call, usually from students of the school's own business education department. It is the type of help available to any other teacher in the system as time can be found.

Only two schools employ a full-time, paid laboratory assistant, one under an experimental preprofessional trainee program.

(Cont. on p. 84)

What methods do you use to evaluate the success of your science instruction?

Replies indicate the following procedures: Teacher-made tests appear to be the backbone of science instruction evaluation, with virtually every district in the sampling reporting this method. Following closely are standardized tests, including Ohio's every-pupil test in science, the Iowa test of educational development and the New York State science survey test.

About two-thirds of the districts sampled use work products as criteria, and about one-third make use of anecdotal records. Other miscellaneous methods are: following up graduates, departmental tests, practical tests, teacher group sessions, and permanent student records (including college reports and laboratory assignments).

What materials, supplies, equipment and resources do your teachers use consistently?

Checked off on the inquiry form by just about every respondent are: textbooks, library sources, audio-visual materials, and scientific apparatus. Field trips, occasionally or at stated periods of the year, frequently are reported, with students encouraged in some instances to make their own exploratory journeys. Other resources mentioned include: industry, residents of the community, consultants and resource speakers, special demonstrations, and consultants' exhibits.

Grouped under reference sources are special science libraries, supplemental books, pamphlets and magazines, classroom reference sets for instructors, extension reference books, student materials, and literature supplied by industry. Under audio-visual materials some emphasize educational television programs, both local and national, such as "Continental Classroom."

Have you any criticism of supplies and equipment for science instruction?

Preliminary to answering this question, one respondent declared that too many teachers depend on manufacturers' products and do not make use of readily available resources. Another said that teachers really have no time or money to inquire about, explore or evaluate equipment.

About 20 per cent of the respondents found nothing to criticize in the area of supplies and equipment for science instruction. The other 80 per cent believes in various degrees that: (1) Equipment is too expensive for the time it is used and the principles it demonstrates, when compared to the limited funds available for science instruction, and (2) textbooks and laboratory manuals often are inadequate.

As a means of reducing costs and yet procuring quality, some suggest standardization of specifications for science equipment, for which manufacturers must look to the schools. Science people recognize that too many types and varieties of laboratory pieces and materials are ordered to make their mass production economically feasible. It is hoped by some that the larger volume of orders resulting

from the N.D.E.A. program will have a salutary influence in this respect.

Representative quotations from the replies received include the following:

"Philosophical revision of chemistry textbooks and courses is needed. Laboratory manuals are out of date; they should include more 'open-ended' experiments and be less of the cookbook format."

"Very expensive, but necessary; a science program must be strong." . . . "In general, the equipment is good; however, there has been a slight indication that apparatus companies are substituting lower quality equipment to enable them to compete price-wise." . . . "Much of the equipment seems to be more expensive than necessary." . . . "Too expensive. Not durable. Too specialized."

"Textbooks are most inadequate." . . . "Microscopes could be better designed for student use, and I think they could be less expensive." . . . "Good equipment is expensive. Textbooks can never be completely adequate. All aids to instruction depend primarily on a good teacher." . . . "Textbooks for slower learners are needed." . . . "Textbooks lean too heavily to factual rather than principle development, but this condition is rapidly undergoing a desirable change. Meanwhile, some improvising is necessary." . . . "Textbooks are too general, oversimplified and try to be all-inclusive."

"Teachers do use older models of materials than they would choose to use. Textbooks in a classroom for six or seven years must be supplemented by current materials."

If you had more funds, and all factors were favorable, what additions would you make to your science facilities and equipment?

Surprisingly enough, three out of 10 respondents either ignored the question or indicated that they had no suggestions. Funds made available under N.D.E.A., even at this relatively early date, seem to have effected some major changes and helped remodeling programs get under way.

Some specific suggestions made as to desired additional facilities, grouped by types of science courses, included:

GENERAL SCIENCE. Additional gas outlets, window shades, portable lecture-demonstration tables, project rooms for gifted students, additional storage rooms, laboratory and equipment adjacent to each classroom, and facilities for a junior high school life experience program. Frequently what is desired is "more of what we now have" rather than something new. Many want more individual laboratory equipment to permit more individualized student work.

Other lists refer to: complete library for each laboratory, more visual education equipment, stereo microscopes or binocular type of microscopes, school owned films, laboratory and equipment for a summer course in ecology. One respondent would remodel the present laboratory with perimeter type furniture and buy tablet armchairs for classrooms. An anatomical manikin and skeleton are included in one list. Another respondent would use his funds to employ a laboratory assistant.

BIOLOGY. In this area, too, at least 10 per cent finds the present facilities adequate, although larger quarters

and more space for individual laboratory work are desired by most respondents. More and better storage facilities and project rooms for the gifted are stressed.

Equipment needs listed include: higher quality microscopes, refrigeration for instructional supplies, models, cultures, additional gas outlets, greenhouse facilities, animal rooms, more flexible laboratory furniture, equipment for use with overhead and microprojection, and meters for radio activity experiments.

CHEMISTRY. About one out of four either reports conditions satisfactory or failed to reply to the question. Aside from general needs listed under other subject headings, respondents indicate that if funds were more plentiful they would purchase the following: microchemistry and organic chemistry equipment and semimicro chemistry apparatus, small library units for instructional areas, facilities for storing project work, better fume hoods and better ventilation systems.

Also needed are: more materials for atomic energy study, centrifuges, pH meters, more charts and tables for balances, low cost electron microscopes, facilities for individual research and "capital outlay" equipment, such as demonstration tables. Some would add atomic and molecular models, steel cabinets, and other storage facilities.

PHYSICS. If science department heads participating in the sampling had more funds, presumably about a fourth of them would not make use of the money; they find present

facilities adequate or not sufficiently inadequate to make note of this in answering this part of the question. Those indicating how they would distribute additional funds refer to the following facilities specifically and to "more of existing facilities" in general: apparatus that will provide opportunity for greater use of variable electric current sources at individual laboratory stations, storage for long-term project work, photography laboratories for time and motion study, more audio-visual materials, and small shops and equipment suggested by the National Science Foundation's physical science study committee's physics program.

Also mentioned is a laboratory for students that would not have to be used for regular classes, and new equipment to meet the needs of students having a broad range of talents. Other indicated possibilities are: stroboscopic lamps, electrical panels, kymograph apparatus, electric panels, scales and balances, microphotography supplies, electronic kits, laboratory equipment for radio work and electrostatic generators for producing high voltage.

Other equipment includes: scales and balances with tables, atomic and nuclear mockups and models for demonstration purposes, telescopes, oscilloscopes, observatory and weather stations, dark rooms, lighted topographic maps and U.S. weather maps, and display cases for rock samples. One supervisor believes equipment for certain phases of nuclear and solar energy should be included in all science planning, and that machinery for a workshop should be provided for each level. (Cont. on p. 86)

MODERN four-student worktable is used for junior science at Peabody High School in Pittsburgh. Here an instructor explains series and parallel circuits. Immediate use can be made of the electromagnet, telegraph and telephone on the horizontal panel in the background, the chalkboard conveniently above it, and the near-by vertical panel display of circuits. Eight of these tables are assigned to each science room.



What are some of the commonest mistakes in planning science classrooms with regard to: water, gas and electric connections, lighting, heating, ventilation, placement of furniture?

Supplementing the answer of his science department chairman to this question, a superintendent writes: "One of the common mistakes in planning science classrooms is the failure to consult with science teachers and department heads during the initial stages of the planning. The result is that many times science areas are too small, storage space is totally inadequate, and obsolete types of laboratory tables are used, making the space completely inflexible."

Another respondent says: "Most commonly, science classrooms are not planned. They are taken from architects' manuals that are 50 years out of date." A third states there is little appreciation of the cultural needs of the various programs of science instruction on the part of schoolhouse planners.

Criticisms fall into four major areas: utilities (inadequate outlets and controls), poor ventilation, insufficient storage, and inflexibility of space. Differences of opinion appear to persist as to the merits of single science classrooms and single laboratories as opposed to the combination arrangement, and regarding the advantages and disadvantages of perimeter arrangement of laboratory tables. But there seems to be general agreement on the following points:

Utilities. Electrical, water and gas outlets often are inadequate or poorly placed. There is lack of variable voltage, and D.C. current is not always available along with A.C. current. Roughing-in of water and gas outlets for future science use often is overlooked.

Hot water at times is missing, even though it is desirable that both hot and cold water be available from mixing facilities and nonsplashing faucets (not spring type). The deep sinks (three are reported necessary for an efficient science room), connected with water and sewer, should be located near the table edge.

In the interest of safety it is urged that a master control switch for each utility be located convenient to the teacher; some urge cut-off facilities at each student's desk. These facilities often are overlooked.

Ventilation. There is a complete absence of hoods in some chemistry laboratories and in others vents of the forced draft system do not seem to be exhausting properly. Unsatisfactory ventilation is reported in both classrooms and laboratories, as well as in storage rooms where volatile materials are kept and photographic darkroom work is done in some schools.

Insufficient Space. This is a common area of complaint for various reasons. Some report that available space is too small for demonstrations and others say space between work tables is too narrow to permit teachers to move around to help students. Most would have more individual work space for students and less crowded lecture room seating. Repeated reference is made to the need for a project room in which students can leave uncompleted work between class periods. A photographic darkroom also is missed in many instances.

Such storage as is provided at times is too far removed

from teachers' quarters; or supplies are not as readily available to demonstration tables as they should be. Faulty planning in some instances has resulted in built-in cabinets in inconvenient locations. Space for storing portable arm-chairs during the laboratory period also is a problem in some cases.

Other common mistakes made in science department planning are: inadequate natural lighting, and/or unbalanced artificial lighting, especially for microscopic work; not enough concern for student traffic; cumbersome, fixed furniture grouped at the center of the room so as to interfere with normal traffic flow, and rooms too small. (Some architects consider rooms 30 by 30 feet big enough.)

Further shortcomings are: inadequate display cases with glass fronts; flooring not resistant to chemicals; no facilities to darken the classroom for demonstration, experimentation and audio visual work; insufficiently large table tops.

One respondent believes that most science rooms are too fragile and delicate; they should permit sawing, drilling and soldering, he declares. One complains that heating methods are inadequate and another reports that the absence of heat in biology classes during nonclass periods makes it impossible to maintain living specimens.

If you had more funds, and all factors were favorable, what other supplies would you buy?

Either because they consider the possibility posed by this question unrealistic or because they show unusual restraint, one-fourth of participants in this study passed over this question. Another fourth indicate that all things considered they have no major problems with obtaining needed supplies. Typical is a respondent's comment that his schools are fairly well equipped after having taken advantage of N.D.E.A.

In making their wishes known, the remaining half of respondents do not differentiate carefully between supplies and equipment. In many instances emphasis is on the acquisition of a greater variety of supplies and the doubling and trebling of the types of supplies now on hand. One department chairman suggests that each teacher should have a reserve fund of \$50 to purchase local supplies as needed during the year in order to promote greater use of homemade or practical items. Mentioned a number of times is a greater supply of reserve materials and specialized supplies for independent student project work, particularly for advanced students.

Among the general requisitions that would be made if funds in larger amounts were available are these: stationers' supplies, such as file folders, hectograph masters, mimeograph stencils and paper; reference books for pleasure reading in all science areas; instantaneous developing cameras and darkroom equipment and supplies. For biology courses there would be more construction supplies, preserved specimens, glassware, living materials, microscopic slides, and licensed radioactive isotopes. Purchase of many "small item" materials (not only basic supplies) is stressed as one method of effecting general quality improvement of the supplies inventory.

(Continued on Page 88)

ON LONG ISLAND, high school pupils study electronics in \$50,000 N.D.E.A. financed laboratory.

LEVITTOWN, N.Y., has a \$50,000 laboratory planned specifically for training students in electronics. N.D.E.A. funds made the project possible.

Seventy students, including six girls, have embarked upon an advanced program of technical electronics at Division Avenue High School. They have been selected from various high schools on Long Island, and have a minimum IQ rating of 120. The three-year program, says Supt. Fred Ambellan, operates within the complex of a comprehensive general high school, has all the desirable characteristics of an advanced, well rounded general education plus the added feature of intensive specialized technical training.

The 70 students have no study periods. Instead they attend classes nine periods a day. In addition to the usual time spent in academic pursuits, they devote one and a half hours each day to laboratory work. During this first year, only Grades 10 and 11 are participating. Next year the program will be extended to Grade 12. Eventually it will represent a three-year project.

The Levittown electronics program was planned by Bernard F. Rappaport, supervisor of industrial arts and vocation-



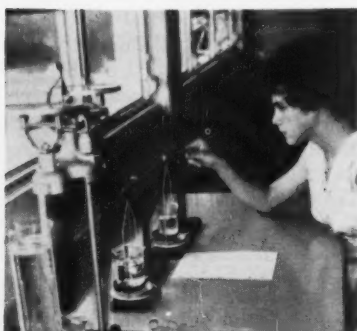
Business Week Photo by Herb Kratovil

al education, with assistance from leaders in the local electronics industry and the New York State Department of Education. Equipment installed includes the latest in teaching devices and instructional aids. In addition to basic circuits, there are units in radar, sonar, microwave transmission, and transistors circuitry. The photograph (above right) shows Robert Gerrity, instructor and former engineer with Brookhaven National Laboratories of the Atomic Energy Commis-

sion, explaining the demonstration circuit to students.

Involved in the technical training courses are: reading complicated manuals and interpreting them correctly; doing needed research and planning; writing analytical reports, and doing creative thinking. The "why" of the operating of a circuit, for example, is considered as important as the "how."

Selection of students for the special work is on the basis of examinations.



'TENTH MONTH' science program was outstanding success last summer at St. Charles, La., when fourth graders studied atomic energy and high school students delved earnestly into the study of electronics.

NEXT June, some three score elementary pupils and high school students at Lake Charles, La., will be continuing their science education for the 10th month. Tried out for the first time last summer, the program was so successful that an expanded offering is being planned for this year.

Twenty pupils were selected last year from Grades 4 through 8, and a like number of students from the high schools. Selection was on the basis of previous performance and on the recommendations of principal and teachers. Applications numbered 125.

The science program was conducted in the laboratories of Lake Charles High School with classes meeting daily from 9 a.m. until noon for four weeks. As the board of education provided financing, no tuition was charged. Interest was high during the entire period, with excellent attendance and children working much longer than the allotted time. Elementary pupils in Grades 4 and 5

delved into such subjects as electrochemical cells, atomic energy, simple electrical circuits, and uses of Ohm's law.

Grades 6 and 7 studied the laws of reflection and refraction, the solar system, preparation of nitric acid and determination of its concentration, generation of gases, electrolysis of water, reaction of oxides with water, and drawings and scale model of a house. In photograph (lower left) Student Jimmy Hoffpaur works on a model.

High school projects included various open-end chemistry investigations, study of light, fundamentals of chemistry and physics with considerable mathematics application emphasized. In photograph (upper left) Renee Reichert is busy with a laboratory experiment.

The project method of teaching was used with children working in small interest groups.

G. W. Ford is superintendent of the Lake Charles city school system. Supervisor of instruction is William M. Smith.

A STATEMENT OF OBJECTIVES

THE science department of Rockville High School, Rockville, Conn., has 12 objectives. Through these it attempts to develop in students the scientific way of living and thinking. By such training it is hoped that they may be objective, impersonal, and unprejudiced in their approach to the problems of a rapidly changing scientific world. The 12 objectives are:

1. To carry out the philosophy of the school.
2. To help the student reach just or true conclusions regarding his present problems and future needs and adjust himself to them.
3. To develop his ability to analyze and generalize and, hence, to distinguish between fact and assumption.
4. To develop an appreciation of the technics for intelligent reading of scientific articles in current magazines and newspapers.
5. To develop an appreciation of the services of science to the world, nation, community, home and individual.
6. To impart information of definite use in daily home life.
7. To cooperate with other school departments to gain an appreciation of the integration of science with other fields.
8. To provide opportunities for participation in avocational and recreational activities.
9. To inspire a spirit of investigation and invention.
10. To develop an appreciation of the historical and cultural background of science.
11. To prepare college preparatory and technical students for future science courses.
12. To begin college work in science where ability and interest warrant it.

Do your science teachers prepare any of their own materials for teaching science?

All participants answered this question in the affirmative. Here are examples of "materials" science teachers report:

Teaching Aids. Workbooks and sheets, instructional guides and syllabuses, laboratory manuals and exercises, curriculum bulletins and guides, mimeograph notes on subjects not covered in a textbook, drill exercises and tests. Closely related are charts and maps, bulletin board displays, presentations, demonstration devices, and materials prepared especially for the slow learner.

Classroom Supplies. Slides for biology specimens, cultures, and collections including salamanders, fish, turtles, cats and insects; plants, flowers and weeds; rocks and soil.

Equipment. Small resistor boards, clip leads, amplifying systems, oscilloscopes, simple defraction grading spectroscopes, "how made" laboratory devices, mockups of batteries, calipers, slide rules, dissection kits, photographic apparatus, and cages.

By whom and on what basis is the budget for science equipment and supplies determined?

From the multitude of variations indicated as to the manner in which funds for science study are authorized,

it can be concluded that the general pattern for the sample studied is this: The science department determines the need, the principal's office screens the requisitions, and the administrative department reviews it and makes the final recommendations to the board of education. The larger the school system, the larger the number of administrative personnel involved in the screening and approval process, but basically the pattern remains the same. In schools with science supervisors, senior supervisors, and science department heads, these persons have their say; so do the business manager, the assistant business manager, senior curriculum head, and assistant superintendents, where these positions prevail.

In a considerable number of schools there is no separate budget set up for the science department. Instead, needs determined by the science teachers (individually, by sections, and/or department) are presented to the principal, then relayed along the remainder of the administrative way. In a limited number of instances budget work, based on previous years' experience, appears to originate at the administrative level, followed by consultation with those directly affected.

Most respondents indicate that after careful study within the science department, requisitions usually are approved by the administration and the board, limited only by availability of funds.

Increasingly, allocation of funds appears to be made on the basis of the number of students enrolled in science courses. With few exceptions, comments suggest a harmonious working relationship between the various persons concerned with allocating science funds.

Here are examples of science education financing procedures:

"A list of supplies needed for the following year is made out by the individual teacher, combined into subject areas by the head of the department, and the total is given as a figure for the science budget to the school committee. The chief drawback is that it is impossible to tell what supplies are needed a year in advance, and inevitably important items are omitted."

"Teachers list items desired; principals edit the list and prepare the requisition; the assistant superintendent does the final screening before passing it on to the superintendent of schools."

"The science budget is determined by the superintendent of schools from information from science teachers received through the principals."

"Each department makes up listings of needs. A consultant prepares requests based upon needs after conference with department heads. A budget request to the finance department has always been honored and has resulted in sufficient funds."

"The budget is prepared by the superintendent, under the request of the principal of the school, and is weighed against the over-all budgetary needs and the income."

"The county school administration allocates funds to the school for all instructional supplies and equipment. The principal then allocates these funds to the different departments in his school on the basis of need."

"A project is presently under way to establish a formula for science based on realistic needs. The present 'budget' seems to be based on 'what funds are available' and is variable, with no fixed amount given in advance."

IN AKRON, inservice training of social studies teachers relieves shortage of qualified science personnel and opens young eyes to field of physical sciences.

A HUGE lode of unexplored science teaching talent lies hidden within the confines of many public schools, educators in Akron, Ohio, believe. At least they have found this to be true locally, where 114 social studies teachers have been recruited for successful teaching of junior high school science subjects.

"We have tried to instruct and equip each teacher to teach basic, simple scientific experiments in his classroom," says Martin W. Essex, superintendent of schools and 1959-60 president of the American Association of School Administrators. The teacher training course, he explains, was designed to help more teachers open the eyes of youngsters early to the field of physical sciences with simple projects in chemistry and physics. This goal has been achieved. In photograph (upper right) two Akron social studies teachers are setting up a Jacob's ladder electrical experiment.

To meet the need for more qualified persons to teach the physical sciences at the junior high level, within the context

of their broader social implications, three steps were taken during 1958:

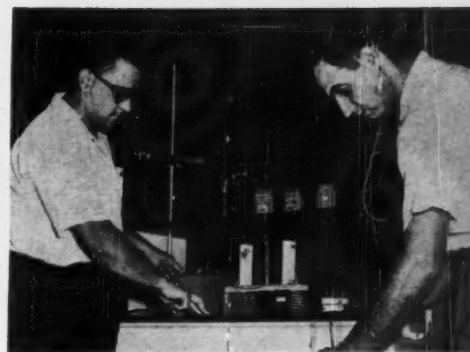
1. A two-week, 70 hour summer science seminar was arranged for all social studies teachers, during which time they were paid at the rate of daily substitute teachers.

2. A resource teacher in science was hired to work with the social studies teachers.

3. A mobile scientific laboratory was purchased for each of Akron's 11 junior high schools.

A double period each day (80 minutes) or 10 periods a week (400 minutes) is set aside for social studies, with science education given two-fifths of the time. Thus, acquaintance with the physical sciences is provided junior high school students for an average of 32 minutes a day, or 160 minutes a week. Actually, teachers use the unit system, balancing blocks of time over a period of weeks to do justice to both subjects.

To date, 114 social studies teachers have received at least two weeks of special training in the sciences, and some have had a refresher course. Currently an inservice class is being conducted for those teachers who did not get to attend the summer seminar. Each of the mobile laboratories, which can be moved from



JACOB'S LADDER electrical experiment is set up by two Akron social science teachers in special science seminar. The summer seminar was designed to bring them up to date on basic chemistry and physics.

classroom to classroom as needed, has been equipped with \$600 worth of supplies and a \$185 microprojector.

Has the science training program for teachers worked? After the first year the junior high school principals unanimously reported that the social studies teachers who had attended the science seminar were teaching science effectively. ■

LECTURE-LABORATORY room combination at Niagara-Wheatfield Junior-Senior High School, Niagara, N.Y. The photograph was taken over instructor's table facing class in lecture situation. Note skydomes above laboratory tables on inside wall at left. Note, too, the fume-removable equipment shown at the center rear of the room.

Photo from Perkins & Will, architects, White Plains, N.Y., and Chicago, and Highland & Highland, Buffalo, N.Y.



An Audio-Visual 'Natural'

WALTER A. WITTICH

Professor of Education, University of Wisconsin

THE content of science education, whether it be in the grades, in the high school, or at the college level, has to do with demonstrations to develop an understanding of natural phenomena. For decades, chemistry and physics demonstrations have been conducted in laboratories and on the demonstration benches before lecture groups as a central means of instruction and learning. Such science demonstrations lend themselves to carefully conceived audio-visual media, such as sound motion picture films, diagrams, flat pictures, and filmstrips.

Students of science education and audio-visual communication technics agree that three positive results take place when science teaching demonstrations are documental in film or filmstrip form:

1. The demonstration always works.

Anything that is finally released in film form represents authentic and completed work. In contrast, many hastily set-up classroom demonstrations either fail or are incomplete.

2. Everyone has a front row seat.

The film or filmstrip maker arranges his photography so that small details are enlarged when projected. Thus details of measurement or physical or chemical change can be photographed through the kind of close-up or changed-time photography that, when projected, will allow everyone in the room to have a "visual front row seat."

3. Because of the economics of film production and sale, costly and necessary equipment can be used. The typical classroom science laboratory is poorly equipped with the apparatus for carrying on science experiments or demonstrations. In many science teaching films, thousands of dollars worth of equipment is used in a 10 or 15 minute experiment. Such elaborate

and highly useful equipment would normally not be found in classrooms.

In discussing the foregoing advantages of audio-visual science materials, those who favor the traditional pupil-teacher demonstration system say:

"However, great good does come from each pupil's manipulations of even a limited amount of science laboratory equipment."

However, no one seems to be able to bring forth research evidence that this good has been measured or that it results in useful change in a student's behavior.

What Researchers Find

It is natural enough, then, to ask what researchers who were investigating the role of audio-visual technics in the improvement of science instruction have to report.

One of the first studies was made by Roulon, who at Harvard University in 1933 investigated the instructional use and efficiency of sound motion pictures among ninth grade general science students. He found this:

"In terms of immediate student achievement, results indicated that the teaching technic employed in the science sound motion picture film was 20.5 per cent more effective from the instructional standpoint than was the usual unaided presentation."

The same year, V. C. Arnsperger investigated the efficiency of science sound motion picture films among upper grade elementary school students in cities along the Eastern seaboard. He reported this distinct contribution of science films to learning: "The per cents of superiority of those students who were in classes in which sound motion picture films in the field of science were used ranged from 22 to 30 per cent among the various natural science units."

During studies conducted among 28 Nebraska communities in 1952, Wesley C. Meierhenry showed similar comparable gains for: "general science and high school physics and biology students who had the advantage of using carefully selected sound motion picture films to enrich and enhance their studies in these science areas."

More recently, Louis Romano discovered that when combinations of audio-visual materials were used in science instruction in Grades 6 to 8, truly remarkable gains in science vocabulary resulted.

His study is unique in that he chose as his subjects children who were already accustomed to a learning environment that their teachers considered unusually enriched.

Greater vocabulary gains were made by the groups that used films. The fifth grade pupils who used films learned up to 300 per cent more of the vocabulary of science, the sixth grade groups twice the vocabulary, and the seventh grade groups 200 per cent more than the control groups learned.

Research over a 25 year period shows that more and better science instruction can be accomplished in the elementary and high school levels when well selected and wisely used audio-visual materials are brought into the stream of classroom instruction.

One has but to examine announcements that arrive daily to witness the many new series of filmstrips, films and related materials that characterize the new teaching materials output of not only film producers but some of the most respected old-line textbook publishers.

It is these new sources of instructional materials that administrators and teachers may wish to scrutinize as possibilities for further improvement of science teaching. ■

FIRST GRADERS examine a plant display that was exhibited at a school science fair. These pupils, at Lexington Avenue Elementary School in Providence, R.I., get 60 minutes of science instruction each week, beginning with kindergarten.



Photo by Providence Journal-Bulletin

THE ELEMENTARY GRADES

and junior high schools report more content and better methods in teaching of science, and also urgent need for facilities and upgrading of personnel

A NATION'S SCHOOLS SURVEY

Summarized by John Sternig

MORE than a half-century has rolled by since Wilbur S. Jackman began his promotion of what was to become modern elementary school science. Jackman has been called the father of elementary school science by Gerald Craig, who himself has been given that title by others.

Jackman laid the basis of science for children as contrasted with Nineteenth Century science dealing with objects apart from the learner. For a time "nature study" obscured the new directions, though it served as a transition between the formality of the old style science and that now advocated. By the 1920's it was apparent that nature study was not succeeding. Its lack of organization, its overemphasis upon incidentals, emotions and esthetics rather than on basic principles and reason led to its demise.¹

By the 1930's the movement for modern elementary school science had gathered momentum, and it has continued ever since. As often happens, a half-century was required for the original ideas to gain full acceptance by most of the profession. Full implementation of the ideas has not even now been achieved.

The year 1960 moves us past the mid-century years. It is now the year 3 S.A. (Space Age). A Space Age motivated public seems to be demanding more science education without knowing clearly what it is asking for.

Are educators better informed? Do they interpret science education to mean production of more scientists or a science-minded, science-informed citizenry — or both? Where is the emphasis to be and at what levels of education? For elementary and junior high school grades, what are the expressed purposes of science education? What is its content; what are the resources and methods used in teaching and learning? What are the problems? What are the proposed solutions? How do educators measure and evaluate the results of their efforts?

These and other questions were answered by 52 elementary school systems in 36 states, schools with science programs now in action. The responses, therefore, do not represent "the state of the nation" but rather that of

¹Craig, Gerald: Elementary School Science in the Past Century, *The Science Teacher*, February 1957.

schools already better than average. What these schools report will follow, together with some comments on each topic in the light of the current point of view toward elementary and junior high school science.

In what grades is a program of science education offered?

Most of the schools surveyed offer planned programs starting with the first year of school and continuing through all the grades. A few depend on incidental experiences in the early years, but most of these indicate that they expect to extend planned programs downward.

This is a hopeful situation and indicates that science has achieved recognition in these schools as one of the basic curriculum areas. Science leaders have been pleading for such recognition as a necessary first step. There is little point in seeking to improve science education until there is some to improve.

How do the expressed purposes of science education rank in the schools?

Five purposes were stated and rank assigned as of much, average or little importance.

1. To provide scientific facts and information.
 2. To develop understanding and use of the methods of scientific problem solving.
 3. To develop scientific attitudes and habits of thinking.
 4. To open new fields of interest and appreciation.
 5. To contribute to basic purposes of general education.
- The consensus seemed to be that the purposes suggested were those used in the schools. All were checked as being of much or average importance with only minor exceptions.

The place of facts and information seems somewhat confused. Schools that considered them of only average importance tended to give much importance to the scientific methods, habits and attitudes. However, many schools consider facts and information fully as important as scientific problem solving, habits and attitudes. It is hard to reach conclusions about the interpretation of this without observing teachers in action in classrooms.

It seems safe to say that most educators are concerned over the frequent discrepancy between expressed *purposes* and daily teaching *practices*. Excellent aims are stated in curriculum guides and in verbal descriptions, but often these cannot be observed in daily work with children. We say we strive to develop critical thinking, open-mindedness, responsibility, resourcefulness, scientific problem solving, and similar characteristics of the scientist in pursuit of new knowledge and truth. Yet our methods suggest that our real purpose is to instill facts, and that facts, rather than the process of discovering them, are the ends we seek.

It has been suggested that perhaps teachers do not really believe the purposes they verbalize and, therefore, lack the basic motivation needed to put them into practice. It has also been suggested that we teach for what we know we must test. Since most school tests are fact tests rather than process or change-of-behavior tests, facts become our goal.

This is not to say that facts are not important. We must remember that skills, habits and attitudes develop from experiences. They cannot be taught or caught in isolation from content. But when the science curriculum becomes the table of contents of a textbook and the learning process is limited to reading the pages, a rather narrow kind of science education results.

Scientists have long been telling us that the greatest contribution of science to modern society has *not* been the

"TO MAKE a doorbell ring, you will need a dry cell, three magnet wires, a bell, and a push button."

Second graders at Gracemount School in Cleveland conduct an experiment in electricity. Experimentation gives firsthand knowledge in matter and energy that can't be gained from mere reading.



marvelous array of discoveries, inventions and technology, but the method by which these came about. The scientific method of problem solving and of searching for truth is the unique contribution. Therefore, more stress on the *method*, along with the facts, is indicated as a purpose for science education. The schools surveyed report having such a purpose.

How is the content of the curriculum organized?

Everyone agrees there must be content in the science curriculum. The survey suggested five basic areas under which all experiences could be organized at any grade level: (1) Living Things, (2) Earth, (3) Universe, (4) Matter and Energy, and (5) Man's Use of Science.

Without exception the schools indicated all five were found in their total program.

Experiences with the subject of Living Things were indicated at every grade by most schools.

Next most comprehensive was the area of Earth Science. Many schools have experiences in this field starting in primary grades.

The Universe as well as Matter and Energy tended to appear in intermediate years and continue through junior high.

Man's Use of Science appeared mainly in upper intermediate and junior high years.

These results are in general agreement with other studies which indicate that there still is a strong emphasis on biological sciences in the early grades, with physical sciences tending to appear later. This tends to produce a weaker foundation in the physical sciences.

The five content areas reveal little of what specific experiences are given children grade by grade. Studies reveal that there is no agreement nationally on just what experiences children should have. Consensus seems to be that there should be planned programs with scope and sequence, locally developed as curriculum guides in terms of local needs and interests. There is also consensus that such programs should be developmental, each year building on what has gone before, though all admit that this is hard to achieve since it requires careful curriculum recording and good staff communication, as well as continuity.

Difficulties in achieving scope and sequence have led to increased demand for grade by grade allocation of content, but all recognize the danger to creative teaching and to flexibility in this approach. One may conclude that the selection of content remains a major problem.

What resources and teaching methods are used?

The schools surveyed indicated that all of the following resources are used consistently in their science programs: textbooks, library materials, science apparatus, audio-visual materials, and field trips.

In addition, some listed the following: specialists and counselors, television and radio teaching, community resources, projects, and free and inexpensive business sponsored materials.

Of the resources listed, field trips were lowest on the list.

These results are in line with modern methods of teaching which accept the point of view that all the senses should

Teaching science through realistic methods has been the aim of John Sternig in his teaching career. Mr. Sternig has been an elementary school teacher, a science counselor, and presently is assistant superintendent in charge of instruction at Glencoe, Ill. He is the author of two film-strip series on astronomy and has written several books including "Beginners Book of Astronomy" and Volume 9 of the "Childcraft" series.



be brought into action in the learning process. The multi-sensory method of teaching goes far beyond the occasional use of an audio-visual aid. It stresses the fact that use of a wide variety of resources which aim at all the senses is now the accepted *method* of teaching and not merely an *aid*.

Schools that claim concern for the methods of science as one of their purposes must submit their teaching methods to scrutiny to see if such methods are used in the teaching. Scientists learn nothing new from reading books that contain knowledge already discovered. The main task of science is to reveal new knowledge about the world and universe and the forces within it, or to develop further the knowledge already known.

It is true that children are not likely to discover new truths for the world, but they should use the methods of science to discover what they do learn rather than to memorize what others have said. Teachers who consider the discovery method as slow and inefficient should remember that in the long run learners tend to retain what was personally discovered much longer than what was simply memorized. If permanent retention and use are the goals, it is likely that rote memorization rather than discovery is the least effective means of learning.

Science teaching has the least excuse of any for not being multisensory. By its very nature it deals with objects and processes that can be directly observed and dealt with. It lends itself most easily to the multisensory method which progresses from firsthand experience through a sequence of actions which bring the mind to bear upon phenomena and which eventually blossom into conclusions, generalizations and other forms of abstraction.

This is why more and more teachers and children are working *with science* rather than *merely reading about it*. Modern science textbooks are no longer written as stories about science but as guides to discovery by the student.

A school system owes it to itself to evaluate whether it provides the staff with the facilities, equipment and supplies that make the scientific way of teaching science easy and natural. It must also examine its philosophy of education to see if it is consistent with this teaching method.

By what methods and contacts do you upgrade the competency of your staff for science teaching?

School administrators admit, almost without exception, that the teacher is the heart of the school system. Its effectiveness rises or falls with the competence of the staff. This survey revealed that schools with good programs of education (including science) also had active programs for promoting growth of teacher competence on the job.

(Continued on Page 94)

The following methods for upgrading staff competence were checked by most of the schools in this study: workshops, demonstrations, consultants, science specialists, college work, and curriculum committees.

A surprising number indicated educational TV was used as an inservice device for staff training and growth.

In addition, the following were listed by a number of respondents: institutes, scholarships, conferences, conventions, science fairs, added pay, idea swapping, publications, organization membership, industrial tours, and a full-time science consultant serving in the school system.

This study did not attempt to get opinions about the quality of preservice teacher training, but responses to other items indicated that many teachers are still not well prepared for elementary science.

Teacher training institutions are improving their offerings year by year, but it will probably always be true that teachers are made in the classroom where they teach rather than in the college course. It, therefore, follows that the school system must provide means for continuous growth on the job if it wants to upgrade staff competence.

How much time for science teaching?

The schools were asked to indicate the principal method for incorporating science into the daily program. An overwhelming number indicated it was done by units in science, separate from other curriculum areas.

A few indicated that their principal method was to integrate science with other curriculum areas.

None used the incidental approach to science as the principal method.

These results are interesting in view of the fact that lack of time for science often is cited as one of the reasons for its absence in some schools. Yet the schools surveyed, with good science programs, found time to offer separate units. In part, this might be a result of the inclusion of junior high classes in the report. These are often departmental and, therefore, schedule science separately. The schools that used integration as the principal method had no classes higher than 6th grade.

There seems to be a feeling that one cannot rely on integration or incidental science for complete scope or continuous sequence through the elementary school. Science has a way of being lost in the stew of other content, or is left out entirely. If its content is lost, its methods are likely to be even more so.

The conclusion seems to be that a carefully selected group of science units each year is necessary to achieve the minimum requirements of a well planned developmental program. In addition, it is hoped that teachers will integrate science experiences, wherever they apply, in all other curriculum areas, and also take advantage of "lessons of opportunity" that come up incidentally or even accidentally.

It might be appropriate to consider that classes below junior high tend to be self-contained, with one teacher in charge of all experiences. In these the classroom teacher is the science teacher. In junior high the science teacher is usually a specialist or nearly so.

This situation inevitably affects the way in which science is offered — or avoided. It is unreasonable to expect a classroom teacher to be an expert in all curriculum areas. Those who are trained in science will be more likely personally

to plan science work along the lines ideally desired. Those who are not will rely on the guide or the textbook or will avoid science teaching as much as possible.

There is no way to avoid the issue of teacher competence and its implications for science education.

How do you measure the results of instruction?

The following devices were used in the schools surveyed.

The methods are listed from first to last, in the order of use: teacher-made tests, work products of children, standardized tests, personal conferences, anecdotal records.

Here we come to the heart of the educational process — the way the teacher determines how the purposes of instruction have been achieved.

It is likely that the sequence reported here is typical for science evaluation. The effectiveness or reliability cannot be judged for any school without the tests and their administration, as well as the way the results are used, being observed.

It is perhaps fortunate that standardized tests in science are somewhat scarce and not extensively used. The very idea of standardizing suggests inflexibility and uniformity. Since so many tests are fact centered rather than process centered, it would appear that the basic purposes of science education would not be well served by them. If it is true that we teach for what we test, it may be that fact tests lead away from rather than toward accepted purposes.

There is no assurance that teacher-made tests do any better. Most of these are largely fact centered, though a teacher who wants to test for basic purposes can do so if he makes up his own test. No matter what purposes are verbalized the teacher reveals his real purposes when he tests, and children quickly learn what is to be expected and proceed accordingly. This is why the final test of the science program lies in the testing program used to evaluate it.

Process and method are of greatest importance in science education. Yet these are the hardest to measure and evaluate. They require observation of the learner in action and of his behavior before, during and after the learning. Each situation and each learner requires a custom-made set of observations, recordings and evaluative judgment.

Many teachers believe it is humanly impossible to do this fully and, therefore, do not attempt it, even in part. This leaves only the work products of children and the facts retained as the measure of their achievement. To be sure, facts are important. It would be silly to say a child is good in science if he has no knowledge in the field. Fortunately also, work products often reveal the process and method. With these, plus a modicum of careful observation, a good teacher can reach sound conclusions about each child.

Gerald Craig sums up the process admirably as follows: "In a sense it is the spontaneous behavior of children — the proposal of something to do, the inquiry, the choice of language in indicating open-mindedness, the critical-mindedness, poise, resourcefulness, the challenge of a statement, the response to a challenge, the stating of an hypothesis, indication of expectation, the willingness to consider new ideas, the use of old learning in new situations and learning — that is useful in evaluation."²

²Craig, Gerald: Science in the Elementary Schools (What Research Says to the Teacher) No. 12, p. 31, N.B.A. Washington, D.C., 1957.



MODEL made of plaster of paris showing steps in soil conservation and erosion control is used in this earth study experiment. The models were developed by a fourth grader in the public schools in Spokane.



IN ASTRONOMY, eighth graders put spots on an umbrella to represent northern constellations. Pupils turn the umbrella to show the apparent movement of the Big Dipper, North Star, and Cassiopea. This demonstration is shown in a St. Louis public school.

Photo by John H. Corfield
Mamaroneck High School, Mamaroneck, N.Y.

TEACHERS, TOO, learn best from firsthand experience. Six faculty meetings were held during the fall of 1959 in each elementary school in Mamaroneck, N.Y., to improve elementary science teaching. Leader and consultant was Katherine E. Hill (left), associate professor of education at New York University and specialist in science education. "How to" classroom procedures were discussed, as requested by teachers in a questionnaire distributed previously. At each building the principal conducted the meetings and followed up by visiting classes, procuring materials, and coordinating the planning.



A GEOLOGIST in Boulder, Colo., points to a geology map showing a dike in a rock formation. Comparing rock formations with a map is more meaningful to students on a science trip than mere observation of geological contours.

Gerald Craig's comment indicates most potently why many consider science education most promising in dealing with individual differences. In science the individual mind in action is always the most important element.



MAGNETISM is the study project of these elementary school children at East Clark School in Cleveland. Pupils learn to recognize magnetic lines of force and then check data with information from textbooks.

BEEF HEART and beef lung are specimens used in studying the human body in a science and health class at Maplewood School in Greeley, Colo. Tribune photo by Bob Beard.



What additional facilities and equipment would you like to have?

The schools were asked to indicate what additions to existing science facilities and equipment they would like to have. The composite list can serve as a useful guide to every school, as well as to commercial suppliers of these products.

FOR SELF-CONTAINED CLASSROOMS:

Adequate supplies of simple science apparatus for teacher demonstration and pupil activities.

Adequate electric outlets.

Water in each classroom.

Hot plates or other room heat sources.

Displays space: tables, cabinets, window ledges.

Work areas for science activities in each room.

Areas for growing things in each room.

Terrariums and aquariums in each room.

Darkening facilities for classroom projection of visual equipment.

More audio-visual machines and equipment.

Science kits of equipment keyed to curriculum.

More library resources, supplementary reading materials.

Storage space for room science equipment.

Science charts.

Petty cash fund for small purchases.

FOR EACH BUILDING:

One equipped laboratory classroom for each elementary building.

A science center to serve as a science resource area.

Equipment such as microscopes, microprojectors, telescope and specialized apparatus needed on occasion.

Cages, boxes, flower pots, and other bulky items.

Specimens, models, charts, skeletons and other three-dimensional devices.

Master collections of leaves, insects, rocks and other local flora and fauna.

Portable laboratory tables with equipment, more extensive than room science kits.

SYSTEMWIDE:

One or more full-time science consultants to work with staff and children.

Greenhouse facilities.

Animal houses.

An arboretum and bird sanctuary.

Adequate clerical and maintenance help for the science department.

Some of the respondents indicated an "I can dream, can't I?" attitude toward some of these items, yet a good case can be stated for every one of them in the planning of a truly ideal science program.

Many present shortcomings in even minimum programs can be traced to lack of the items listed. Teachers generally make a plea for room equipment to reduce the need for sharing, which often results in non-use of items not readily available when needed. Such lack of availability of activity and demonstration materials is responsible for much of the



THREE EXPERIMENTS in heat are being demonstrated simultaneously by eighth graders in this general science room of Whittier School in Oak Park, Ill.: condensation of water, expansion of a heated wire and of a liquid.

reading and talking about science, since reading and talking can easily be done with materials right in the room.

It would appear that schools planning for expansion of science programs would do well to consider:

Some science rooms fully equipped.

Remodeling of regular classrooms for science activities with basic supplies in each room.

Portable laboratories.

Systemwide supplies of specialized equipment in conjunction with a science center.

Special community facilities or school use of existing ones — park areas, arboretum, greenhouse.

A science specialist as science curriculum director, counselor and teacher.

What significant changes or innovations have been made recently?

The schools were asked to indicate what major changes had been made in their science programs in the last five years, and to describe features they considered especially significant. Responses are summarized in the following categories:

CURRICULUM CHANGES:

Development of unified and coordinated K-12 science programs.

Bringing existing programs up to date with space science, atomic science, International Geophysical Year.

Content reduced, concepts stressed.

More physical science earlier in grades.

Tighter planning to avoid any duplication.

Integration of health and safety with science.

Special science challenge for the gifted.

General upgrading, such as biology in 9th grade.

Studies on how to integrate science with other curriculum areas.

METHODS CHANGES:

Shift from reading-listening to problem solving activity science.

Emphasis on teacher demonstration and more pupil activity.

Emphasis on meaning and understanding of principles through application.



ACTIVITY MANIPULATION and reading are combined in science learning at Monroe School in Omaha. One pupil reads from a textbook while another performs the experiment being explained by the reader with text.

RESOURCE CHANGES:

- Textbook adoptions, especially problem centered series.
- State curriculum guides.
- Classroom equipment keyed to units.
- Greater use of multisensory resources and methods of teaching.
- Increasing use of educational TV.
- Broader use of community resources.

ORGANIZATIONAL CHANGES:

- Definite time for science in the daily program.
- Better supervision.
- Increased use of science counselors.
- Pilot studies.
- Inservice work for upgrading competence.
- Inservice work on staff development of science guides and units.
- Greater coordination and communication at all levels.
- Greater recognition of need for specialized systemwide leadership.
- Pupil involvement beyond the regular program: honors groups, after-school groups, summer sessions, individual projects, science fairs.

Most of these changes are in line with the trends indicated in this total report. One item, however, deserves a word of caution — science fairs. The school administrator as well as the science teacher may find these appealing for the wrong reasons. They are very popular as public relations devices, but it is well to ask how well they interpret the purposes of science education or the program of the schools.

Glenn Blough, in a report of a special conference of the National Science Teachers Association, has this to say about science fairs: "They should be, insofar as possible, an outgrowth of the ongoing science program. In the elementary school, if not at higher grade levels, emphasis should

not be directed to the giving of prizes and awards. There should be many group projects which show the work of a class study as well as some individual exhibits. Small fairs confined to individual schools are recommended, but administrators, parents and others should be urged not to evaluate the school science program on the basis of what they see at a science fair."² This statement presumably represents consensus among some 250 leading science educators involved in the conference.

What are the most persistent problems?

Schools were asked to indicate problems that persist, even when reasonably good science programs are in action. The ones given may be a comfort to the administrator who feels frustrated at the snail's pace with which progress takes place. Most persistent problems pertain to staff: teacher insecurity in science, poor preparation, rapid turnover, and the need for continuous inservice education just to keep from sliding back. Other problems are:

- Poor space, facilities, supplies.
- Overcrowded curriculum, lack of time.
- Logistics — getting teachers, pupils, materials, methods and curriculum together at the right time and the right place.
- The overwhelming mass of science content and the lack of agreement on basic concepts and principles.
- Lack of trained leadership.
- Inadequate evaluation procedures.

The fact that problems persist should discourage no one, so long as their existence serves as a challenge to find solutions. It should be remembered that life on earth is one long series of problems. New ones appear as fast as old ones are solved. Perfection cannot be found in this temporal world.

²Blough, Glenn: *It's Time for Better Elementary School Science*, National Science Teachers Association, p. 24. N.E.A., Washington, D.C., 1958.

GUIDELINES FOR ACTION

The 10 topics presented in this report and the interpretations offered upon each remain useless unless some action results. What can the reader do to improve an existing science program or to establish a new one?

1. Take stock! What science education do your schools now offer? At what grade levels? How would you describe the purposes to an inquiring parent? What would you say about the content, the scope and sequence, the resources and methods used, the means of evaluation, the actual results? Do you really know?

2. Where do you want to go? Perhaps your self-inventory leaves you satisfied and the reading of this report merely confirms what you already know and are acting upon. If not, what then?

3. Begin somewhere! "The longest journey begins with a single step." After taking stock determine what is for you the most practical first step. Is it a matter of your leadership

further to motivate what the staff already is committed to? Is it a matter of starting anew?

4. Do something, don't just talk about it. Many problems remain unsolved because people talk about them, and having done so, feel that something has changed.

5. Act upon the following:

Make sure your schools have an understood and accepted set of purposes for science education.

Develop cooperatively a curriculum guide with complete scope and sequence in its content.

Provide the essential facilities and resources for good science teaching.

Establish a continuous inservice program to upgrade teacher competence and improve methods of teaching.

Determine a set of procedures for continuous evaluation and revision of your science program.

Put into effect a sound program of evaluation to test and measure results of instruction in the classroom. ■

Basis for optimism . . .

Teachers and Scientists Form New Partnership

JOHN R. MAYOR

OUTSTANDING in the many efforts directed toward improving science instruction is evidence of a growing spirit of partnership and good will by groups of persons assumed to hold differences of opinion. This is represented by the teams of scientists and secondary school teachers who are working together in the development of curriculum materials.*

With an indication of considerably extended activities, nationwide curriculum studies are making it possible for teachers from elementary school through college to work together in planning programs in mathematics and science from the elementary through college level.

One of the most promising avenues for future improvement is the development of better relations among teachers at all levels of instruction.

Some Concerns

There is, of course, some justified concern about overemphasis on science education and special privileges being provided for science teachers through stipends for study during the summer and academic year.

Two principal dangers appear in the effort to improve science instruction:

1. The possibility of giving too much attention to programs for the gifted, which results in a neglect of science for general education.

2. The possibility of devoting too much school time to the study of science at the expense of other important areas of general education.

It is encouraging to note, however, that many curriculum studies show a growing concern for general education. Materials used in physics and mathematics studies are being tried out with children of medium and low ability as well as with gifted children. Few, if any, voices in science are asking for more time in the school day to study science; rather, scientists are trying to make better use of the time now available for the study of science and mathematics.

Basis for Optimism

There is so much evidence of success and promise for progress in science education that it is difficult to avoid a glow of optimism, especially when comparing the action and constructive effort of 1959 to that of the last 25 years. This optimism also is based upon the hope that similar effort by scholars, teachers and administrators can be made in other areas of the curriculum, particularly in the fields of social sciences and humanities.

The pattern of successes and shortcomings established by science teachers can prove extremely profitable to other groups. ■

Photo by Davis Studio, Washington, D.C.



HEADQUARTERS for some 60,000 A.A.S. members is this modern office building in Washington, D.C.

The author of this article is director of education of the American Association for the Advancement of Science in Washington, D.C.



VELOCITIES of two balls before and after collision are shown in this stroboscopic picture by Berenice Abbott, Educational Services Inc.

The information in
this article was compiled
with the assistance and cooperation
of the Scientific Apparatus
Makers Association

Myriad of Teaching Aids

MANUFACTURERS of laboratory apparatus and equipment are working overtime these days to provide the instruments and furniture in demand for science education.

More than 2000 teaching items for use in science courses are available for today's students. The manufacturers' emphasis is not only on quantity but on quality.

Hand in hand with this development has been the expansion of a highly specialized industry that designs and manufactures laboratory equipment (furniture). The previous decade's production of "millwork" is a thing of the past, now that a complex modern laboratory is being designed.

The schools of today are taking into account that students in science courses require their own work area at a laboratory table, with a part of the room designated and equipped for special group projects. It is also being recognized that a portion of the science room or an adjacent room should be available to the instructor and students in preparing special apparatus or for displays and projects requiring several days or weeks of preparation.

Another present-day trend is to provide ample storage space for the many necessary pieces of equipment.

Though students should perform most experiments themselves, either individually or in groups, in many instances demonstration by the teacher is preferable because the apparatus is too delicate or the materials are unusually hazardous.

Going along with the requirements of larger classrooms, equipment makers are meeting this demand by devising apparatus large enough so that all students can easily view the demonstration. Too, overhead projectors that come equipped with large stages are becoming an integral part of the science classroom. Hereby, Newton's interference rings, slides and model verniers can be projected to a large viewing audience.

Physics, chemistry, biology and general science are still the basic science courses in high school. However, a second course in each of these fields is coming into the picture, primarily because of the advanced science education program this country is undergoing. Thus, high schools are using equipment and conducting experiments that formerly were restricted to the college level.

In physics, for example, new equipment is being made available for new applications. Included are thermistors, items to measure electrical currents in terms of analytical weights, and apparatus that simulates the scattering of alpha particles by atomic nuclei. Geiger counters employing simplified late model technics for beginning students and scaler circuits for the more advanced student are tools

Enhance Quality of Instruction

presently available in high school laboratories. Instruments to demonstrate the fundamental principle of gas mechanics, including Boyle's law, van der Waals' corrections, and Avogadro's law are being supplied.

Small model atom smashers, which produce up to 75,000 volts and sparks up to 2 inches long and yet are absolutely safe, are also at the hand of today's student.

New apparatus developments in the biological sciences are moving ahead as rapidly as in the physical sciences. Unbreakable rubber models are replacing plastic models. Microscopes and microprojectors have been simplified and modernized, and the optics have been improved.

Other interesting items include apparatus for tracing radioactive elements through the branches of growing plants or for showing the half-life of a radioactive material that disintegrates in less than a minute and can be measured to within a second. A portable isolation unit requiring the use of rubber gloves and high filtration permits the students to work with radiochemical techniques for the atomic age.

Mobile laboratories are convenient for teaching small or large classes using visual demonstrations.

Special kits are finding their place among teaching aids to demonstrate the basic laws and principles of electricity, nuclear physics, and chemistry. They save thousands of hours of assembly, and they cost one-third the price of pieces individually purchased.

The cost of equipping a science laboratory-classroom varies considerably with the subject and with what the teacher considers essential. In any case, equipping a laboratory is not a "one-shot" proposition. It is a continuing function for which new and better equipment is constantly being developed.

According to the National Science Teachers Association, the estimated cost of minimum demonstration and laboratory items for one high school chemistry class of 24 pupils is \$5000. The annual replacement expenditure is \$2400.

For physics, the cost runs up to \$10,000, and the annual replacement expenditures to \$525.

For biology, the apparatus, initial installation, and microscopes cost approximately \$5500; the annual replacement expenditure, \$800.

For general science study, the estimated cost is \$6000; the replacement expenditure, \$800.

In elementary science approximately \$660 is required for a class of 24 pupils; the annual replacement figure, \$115.

The average estimated cost of delivery and assembly of laboratory furniture for the foregoing sciences are as follows: general science, \$6000; biology, \$6700; physics,

\$9600; chemistry, \$12,600; two preparation rooms, \$2900.

When remodeling is necessary, as in the case of older schools, the cost for construction, new wiring, plumbing and the like is from 33 to 50 per cent higher than normal construction costs.

The "Purchase Guide," recently developed by the Council of Chief State School Officers, is the first of its kind in American education. It contains advice and specifications on the purchase and educational functions of more than 950 selected items of equipment for instruction in science, mathematics and modern foreign languages.

Research and development programs sponsored by laboratory apparatus and furniture makers are of vital importance to all concerned.* The industry is investing more than 6 cents per sales dollar in research, whereas the national average is approximately 3 cents per sales dollar — this to ensure the nation's progress in science.

New types of paints and finishes and stronger, more durable materials are constantly undergoing close scrutiny. Many apparatus and instrument parts once made of wood are now being made of metals or plastics, which serve better, last longer, and usually are less expensive. More color is being used, and classroom equipment is being simplified.

One new item that will soon be found in every classroom is radio apparatus to demonstrate the projection of sound from one side of the room to the other. Stroboscopic equipment for stopping high-speed rotations or vibrations also will find its way into the classrooms. Solar cells, transistors, high stability mercury cells, and various semi-conductor devices will soon be available. Such terms as "energy levels," "cariolis force," "solid state chromography," and "plasma" will become common terminology in our high schools.

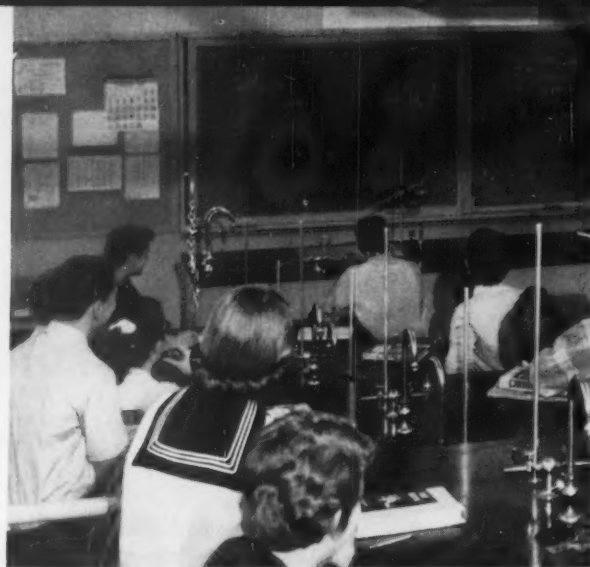
A study by the Research Division of the National Education Association ascertained that all public secondary schools spent a minimum of \$30 million for science equipment, apparatus and supplies in the fiscal year prior to the spring of 1958. The minimum unfilled needs at that time were estimated at almost \$94 million more.

As of June 30, 1959, appropriations of \$49.3 million for the purchase of equipment and materials were used to improve the teaching of mathematics, science and modern foreign languages, and for minor remodeling of laboratories to accommodate the equipment.

From 1959-60, \$68.9 million will be spent; 1960-61, \$111.6 million; 1961-62, \$111.6 million. These estimates are from the United States Office of Education. ■

*In the laboratory furniture industry alone, almost 10 per cent of the total labor force consists of layout men, draftsmen, engineers.

IN CONTRAST to the two-station, lecture-demonstration situation is this single-station laboratory at West Seattle High School in Seattle. Designed to accommodate 32 students, the total allotment of floor space is no greater than that shown in picture at lower right. This station enables an instructor to move freely from desk to desk, and students can easily see the instructor because the combination desk-laboratory tables are arranged in a stairstep fashion.



Single-Station Lab Solves Space, Supervision,

LYLE WATSON

Assistant, Science Education, Seattle Public Schools

IT ALL began about six years ago when we had an opportunity to design the space for science education in a new school. Since that time we have built new or remodeled or completed plans for chemistry and physics laboratories in seven high schools. By a process of successive refinements we have arrived at a plan that is meeting our objectives: the single-station laboratory.

Confronting us at the time of our initial planning were the drabness and general unattractiveness of existing science work space, along with extreme congestion. More space was needed, but the high cost of laboratory installations had to be dealt with. We also wished to improve safety standards and to make better use of instructors' time.

Design of the single-station arrangement, which is now par for Seattle, is intended to meet the requirements of science courses as they are taught today. After more than five years' experience with the combination sit-and-listen and laboratory work station, we find it to be more functional, safer, easier to supervise, and less congested than the traditional arrangement. There is easier movement of students and teachers away from each desk table (an important safety item), and

there is less confusion during laboratory sessions.

The basic elements of Seattle's single-station laboratory represent a combination of the thinking of many persons as they have acquired experience with this facility. Major characteristics are:

1. One Room. Students have only one station for lecture, recitation and laboratory work.

2. Tiered Seating. Students' combination desk-laboratory tables are arranged in a stairstep fashion, so that the combination desk tables are at successively higher stations. The sit-and-listen station is also the lab station.

3. One Chair. Students sit on stools at their table-desks for lectures and demonstrations. This formerly meant that they had to turn on their stools to face the front. A more recently designed swivel stool with back rest is meeting this objection.

4. Hideaway. Provisions are made to help relieve the difficult situation of a "floating" teacher. Space is provided for the teacher dispossessed from his laboratory to study or prepare for the next lecture at an illuminated desk with book shelves above it.

5. "Library." Alongside the laboratory (or back of it) is an auxiliary

work space where students may work during free periods under nominal visual supervision of an instructor without interfering with the class that he is conducting.

6. Storage. Since the chemistry laboratory is designed for the semi-micro technic, there is no side shelf for chemicals. Provision is made at three or four points around the perimeter of the room for electrically driven centrifuges, which have replaced the time consuming filtering process.

7. Exhaust. In the chemistry laboratory no fume hoods are provided. Instead, a single independent exhaust system is used. This the teacher controls. It is designed to remove gases at both the ceiling and floor levels. Exhaust ports are located in the risers at six points.

8. Compressed Air. In the master drawings compressed air is indicated for each student chemistry table and for both demonstration tables. However, this is not a requirement. We specify compressed air only in those cases in which we are close enough to the industrial arts shop to share its compressed air system.

9. Outlets. The student tables in the physics laboratory have gas and electric outlets on the front of them.



Photo by the Seattle Times

Safety Problems

Thus they are not a nuisance during recitation or lecture sessions. In the physics laboratory, the only electrical service to the student tables is 110 A.C. We provide a number of portable low voltage D.C. power supplies.

10. Working Heights. For physics laboratory work two heights are available at student desks: a sit-down height on one side and a stand-up height on the other.

11. Traffic. Spacing between the rows of student tables is 4 feet. This permits the instructor during the laboratory session to walk about freely to every station, even though students are working back to back at neighboring rows.

12. Workroom. The student laboratory materials for physics are issued by the day and are stored in a series of drawers in the workroom. Materials can be checked out through a pass window at the front of the laboratory. This arrangement makes it possible for an instructor or a student assistant to prepare the materials (or demonstration setups) even while the laboratory is in use by another class.

These various features in refined form have become typical of our chemistry and physics laboratory system in Seattle. ■



TRADITIONAL chemistry or physics laboratory consists of two areas. One includes a demonstration table for the instructor and tablet armchairs for students. The other provides working space for students to manipulate equipment. This is commonly called a two-station arrangement.

Four-year study by national committee produces

A New Emphasis on the 'How' of Physics

E. P. LITTLE

Assistant to the President, Educational Services, Inc.

MORE than 12,000 students, from Maine to California and from Washington to Florida, have just passed the halfway mark in a new kind of high school physics course.

Most reports give vivid pictures of students, and their teachers, working harder than ever before but finding a reward almost unique in their school experience. Most girls find that they are on the same footing with the boys because this new course is not based on the man's world of machines and gadgets.

What is this new course? It is usually called the P.S.S.C. course because it has been developed by the Physical Science Study Committee,* a group of physicists, science teachers, and educators who became concerned about the quality of the physics courses usually available in the nation's high schools. Members of the committee knew that greater changes have taken place in knowledge and understanding of physics in the last 50 years than in the previous 500, and they found that the modern textbooks reflected almost none of this change. They believed strongly that, in a world where non-scientists are increasingly subjected to pressures resulting from scientific advances, the students of today should become familiar with the processes of science, and with its scope. In a country proud of its educational system, the familiar high school physics course was woefully out of date.

The P.S.S.C. course begins with a general introduction to the fundamental physical notions of time, space and matter: how we grasp and how we measure them. As the student learns of the almost boundless range of dimension, from the infinitesimally small to the immensely large, from millimicroseconds to billions of years, he also finds out how these quantities can be measured. Instrumentation becomes an extension of his own senses, and he learns to assemble, calibrate and use instruments in laboratory work. From experiments in time and space the student moves easily to an understanding of velocity and acceleration, of vectors and relative motion.

*The Physical Science Study Committee was organized in 1956 at Massachusetts Institute of Technology. The work of the committee has been sponsored by the National Science Foundation, the Fund for the Advancement of Education, the Alfred P. Sloan Foundation, and other organizations. Educational Services Incorporated, which now administers the work of the Physical Science Study Committee, is a nonprofit corporation created in part for this purpose in December 1958.

Things that move obviously have properties of their own. The structure and organization of materials, the concept of mass, the chemist's evidence for atomic and molecular sizes are all merged in an increasing awareness of matter. Direct experience is provided in the laboratory where, for instance, the size of an oil molecule is computed from measurements of the thin film produced on water by a drop of oil.

From this introduction many students emerge with a sense of the high adventure of science and with some of the attitudes they must have if they are to participate in that adventure, either through a career or as intelligent citizens in a science-minded world.

The broad picture is gradually filled in with carefully chosen detail. Here we begin with light, and the student moves easily into a study of sharp and diffuse shadows, reflection and refraction. An attempt to explain these phenomena leads to the development of a particle theory of light, which ultimately fails to predict the change in the velocity of light at an optical boundary. A wave theory is then developed as the only possible alternate, and the laboratory provides an unequaled means of becoming familiar with the characteristics of waves. Interference and diffraction are discovered in a ripple tank, for instance, before they are found in light.

Study Kinematics and Dynamics

The principal emphasis in the first half of the course is on the kinematics of our world: where things are, how big they are, and how they move, not why. The second half of the course begins with a study of dynamics, the effects of a force, the concepts of energy and momentum. Simple laboratory apparatus constructed from roller skate wheels, a piece of 2 by 4, bricks as masses, rubber bands for applying



PHYSICS STUDENTS measure the interrelation of force, mass and motion in Newton's law with a laboratory apparatus made of roller skate wheels, a piece of 2 by 4, bricks, rubber bands for applying force, and a doorbell buzzer for timing.

Reports from teachers vary considerably. Some believe that the course is suitable only for academically talented students. Others say that the slower students gain more, proportionately, than the brilliant ones. The problems in the text are more searching than most students have tackled before. But the feeling of satisfaction resulting from expanding powers of analysis and comprehension is new and exhilarating to many.

forces, a doorbell buzzer as a time standard enable students to measure the interrelations of force, mass and motion. The apparatus is simple; the concepts developed from it are penetratingly general.

The extraordinary story of the discovery of universal gravitation, as a prediction, as an extension of theory and known laws, as the result of an educated guess, becomes a saga of intellectual achievement. The continued expansion of knowledge, the building of new upon old, the open-endedness of the future appear as truths from experience, the history of mankind.

The significance of submicroscopic particles as the cause of physical and chemical changes observed on a macroscopic scale is continued into the final part of the course. The electrical and magnetic properties of matter are conceived as a fundamental characteristic of these submicroscopic particles. But the same properties become a powerful tool for understanding the nature of the particles, both their external and their internal structure. Experi-

mental facts clearly tie electric phenomena to the electromagnetic spectrum and, therefore, back to light. But light, in the photo-electric effect, appears to have particle properties in addition to the wave properties discovered earlier in the course. Thus we find photons and, through them, the energy levels in atoms. The Bohr model of the atom acquires a meaning that could not be obtained without this careful construction of atomic concepts.

New Learning Aids Are Created

The new course has gradually evolved from the joint efforts of several hundred people. From the beginning, in 1956, it was apparent that the problem was tremendous. A completely new set of learning aids was needed, including text, laboratory instructions and apparatus, films, examinations, and material for supplementary reading. During the last three years, these aids have been laboriously created, carefully and widely tested, and then rebuilt. Now these aids are being read-

ied for commercial production.

The new course in physics is only one of several educational changes now taking place in high schools. For several years, mathematics teachers have been testing the new approaches of the College Board Commission on mathematics, the University of Illinois Committee on School Mathematics, and the School Mathematics Study Group at Yale University. All of these groups have produced a variety of text materials and their programs are being used experimentally in a number of schools. The Chemical Bond Approach Committee, based at Earlham College in Richmond, Ind., has a new text, "Chemistry" partially written and being tried in nine high schools. The biologists have joined forces with the Biological Sciences Curriculum Study Group to produce a set of teaching films and suggestions for material to go in textbooks.

The foregoing developments are all part of a general reevaluation of educational content and procedures stirring the country today. ■

Institute for Biological Sciences Sponsors Flexible Curriculum, Films and Lectures

THREE educational projects are being sponsored by the American Institute of Biological Sciences: a curriculum study, a biological sciences film series, and visiting lecturers.

Curriculum Study. The curriculum study began last February on the campus of the University of Colorado, Boulder, with initial grants from the National Science Foundation. While the program will study and evaluate the biological curriculum at all levels, presently it is centered on the secondary area. Arnold Grobman of the University of Florida is the director.

"There is no intention on the part of the committees to establish a rigid, standard biology course for the country, or to lay claim to a definitive course," states Martha J. Acker, assistant director of educational activities for A.I.B.S. Rather, they hope that the resulting courses, textbooks and manuals will encourage individuals to write additional texts and make

further studies regarding new developments, Dr. Acker reports.

Much of the curriculum work is being done by five major committees within five areas: content, innovations in laboratory instruction, teacher preparation, gifted students, and publications. A large number of professional biologists are involved. Goal of the writing conference to be held this summer is to produce a sample textbook and laboratory manual, which subsequently is to be tested in 100 schools in 10 population centers. Preliminary editions are to be released for the 1961-62 academic year.

Films. The biological film series is planned primarily for the 10th grade. The course, expected to be ready for use by next fall, is to consist of 120 lecture-demonstration films of 30 minutes' duration, each closely correlated with the teachers' manuals and study guides. Films are to be available singly, in combination, or as a set.

Visiting Lecturers. The high school lecturers' program, started last fall as a successor to the college speakers' program, is intended to develop intellectual curiosity about the biological sciences. Students meet with scientists to learn new developments.

Flexibility Is Keynote

Keynote of the entire, three-part A.I.B.S. program is flexibility in the arrangement of its many parts. Each teacher will be encouraged to continue to teach in his own way and by his own method, for the Institute believes that standardization would breed mediocrity. The program is flexible mainly because it makes allowances for the inevitable changes that come with rapid advances in science.

"It is especially important that school administrators become cognizant of this new curriculum study," declares Arnold B. Grobman, director of the American Institute of Biological Sciences. "For eventually it will be their responsibility to act on any recommendations that may come forth from this investigation." ■

Science Teachers Express Opinions On Administration Practices

HOW well does the administrator understand the problems faced by those who teach science courses?

Five hundred members of the National Science Teachers Association, selected at random, were given an opportunity to express their opinion on this problem in a survey conducted by James Irving, executive secretary of the Laboratory Equipment Section of Scientific Apparatus Makers Association, Chicago. The teachers re-

sponded to a list of basic principles for planning, based upon ideas furnished Mr. Irving by 30 teachers of science in both elementary and secondary schools.

The Nation's Schools was permitted to examine the entire survey. Reproduced here are the responses to 16 questions received from 344 (68.8 per cent) of the 500 to whom the questionnaire was mailed.

The teachers also were asked to list

the types of equipment "needed most" by science education departments where shortages exist. The "most needed" items reported are as follows:

BIOLOGY: microscopes, audio-visual equipment (including slides), specimens (including models and charts), gas, sinks, water facilities for individual groups, glass tubes, more furniture and facilities, electrical equipment, dissecting kits and pans, chemical balances, kymograph, centrifuges, sterilizer or autoclave, transfer chambers, fume hood, spectroscopes.

CHEMISTRY: exhaust fan or hood, microscopes, test tubes, ring stands, and

(Continued on Page 146)

PRINCIPLES FOR PLANNING

	Agree (per Cent)	No Opin. (per Cent)	Disagree (per Cent)
1. Administrators realize that science classrooms are atypical and that free room time is necessary to set up laboratory work	48.4	7.4	44.3
2. Principal and/or superintendent understand necessary physical facilities (location and size, furniture, value of light exposures, and the like) are needed for science instruction	59.2	5.3	35.5
3. The teaching demonstration is favored by our administrator over individual student laboratory work	20.3	44.9	77.1
4. Student and teacher research facilities are readily available	21.5	7.7	70.8
5. The administrator in our school has implicit confidence in my recommendations for improvement of science education	57.6	17.7	24.7
6. Teaching and student laboratory space is adequate	29.4	0.3	70.3
7. The cost of teaching apparatus and instruments prevents our acquiring adequate laboratory and demonstration items	49.4	6.2	44.4
8. Administrators understand that the science curriculum is a K-12 experience	59.1	13.6	27.3
9. Our science facilities are flexible and adaptable to a variety of student interests, capabilities and needs	44.2	9.1	46.6
10. In general, administrators encourage joining professional societies and attendance at meetings of these societies	77.3	9.0	13.7
11. In planning for laboratory furniture, our administrator and faculty members suggest to the architect the type and kind of furniture best suited to our specific needs	83.2	3.9	12.9
12. Administrators realize the peculiarly significant maintenance needs of the science department and exert every effort to see that plumbing and electrical repairs are attended to quickly	54.8	7.2	38.0
13. Science teachers are excused from such duties as the study hall, because our administrator realizes a special need for preparation time	11.2	4.7	84.1
14. Administrators place too high a value on textbooks and laboratory manuals	13.2	33.7	53.1
15. Science education is being overemphasized in relation to the total curriculum	10.5	6.4	83.1
16. Television, motion pictures, and audio-visual aids will some day replace teacher demonstrations and student laboratory work	4.4	3.2	92.4

**Seven-state study, revealing inadequate
financing of school science programs and lack
of acceleration paints bleak picture of**

Today's Facilities and Equipment

CHARLES L. KOELSCHÉ

BBETTER science teaching depends partly — and importantly — on the right kind of space and on adequate equipment. Many high schools lack appropriate space, and many lack the equipment and supplies for good science instruction.

To learn just what the present picture is in regard to science facilities and equipment, a seven-state study was carried on during 1958-59 under a research grant from the U. S. Office of Education. The figures are now in.*

The University of Toledo directed the research, aided by state committees in Florida, Illinois, Massachusetts, North Dakota, Ohio, South Carolina, and Wisconsin.

*The research reported herein was performed pursuant to a contract between the University of Toledo and the U. S. Office of Education, Department of Health, Education and Welfare. The views expressed in this article are those of the author only.

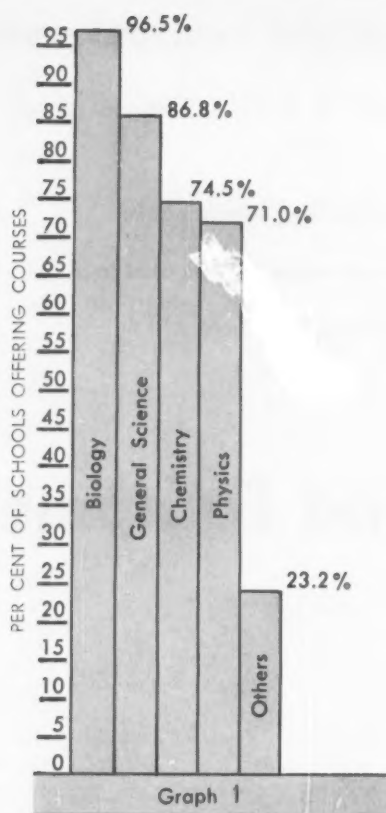
Teams of specialists traveled to 855 high schools selected at random from those offering one or more courses in science. The specialists observed matters at first hand. For their interviews in each school they used uniform guide sheets and check lists. The material they accumulated was brought back to their state director and thence to the university research staff, and these data then were processed mechanically.

What is the picture? It's certainly not reassuring.

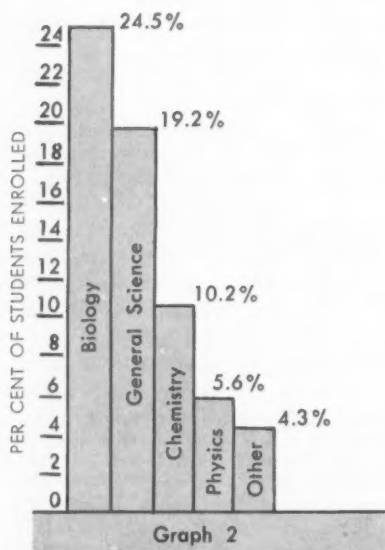
More than half the schools studied do not have the space required for laboratory work. Six out of every 10 schools visited were found to be using improvised equipment, and using it extensively. While certain academic programs seemed to have plenty of money per student participant, funds for sci-



Charles L. Koelsche was specialist for secondary school science with the U.S. Office of Education when this study was made. Since November 1959, he has been special assistant to the director, Office of Scientific Personnel, National Academy of Sciences-National Research Council, Washington, D.C. Before his appointment to the U.S.O.E. in 1958, Dr. Koelsche had taught at several colleges and universities. These include the University of Alaska; Arizona State University, Tempe; Wisconsin State College, Eau Claire, and the University of Toledo. He is the author of numerous articles on science education.



COURSES OFFERED. Graph shows per cent of 855 schools offering each of the science courses.



ENROLLMENT: Graph shows per cent of students enrolled in each of the science courses offered in 855 schools.

Fewer than half

ence education in the same schools were meager — obviously inadequate. Equipment for good physics teaching was especially poor. Physics fared worst; chemistry best.

The high schools studied constitute one-fourth of the public secondary schools in the seven states. Of the 855, there were 282 junior-senior highs, 512 regular four-year highs, and 51 senior highs. In the six-year schools, data covering the 7th and 8th grades were not tabulated.

While some of the schools were small (fewer than 200 students), the students enrolled there represented only one-ninth of the 366,712 students in all of the schools surveyed. Two-thirds of the students attended schools with more than a thousand enrollees.

Who did the interviewing? High school science teachers, county and state science consultants, or college and university professors of science or science education made up the state survey teams. They met for instruction on procedures before, during and following their school visits. At a final state meeting, over-all evaluations of the current status of facilities and equipment were formulated for that state.

Toward Multipurpose Rooms

Certain general trends are reported. Coming into favor is the combined science classroom-laboratory (multipurpose room). In smaller high schools, the combined classroom-lab is equipped for teaching two or more subjects. In general, the large schools have science rooms equipped for a single science subject. Usually the larger the school the better the equipment and the better the facilities for teaching science.

Students still pay breakage and laboratory fees in one-fifth of the schools. Science teachers, principals or superintendents make purchases di-

of our schools have adequate laboratory space!

rectly from the supply houses, in most cases. Only 10 per cent of the schools pool their orders and submit them to suppliers for bids. Few schools get science funds or equipment donations from outside sources, except, of course, federal surplus property.

The portion of schools that schedule a given science subject varies from year to year. Many schools alternate physics and chemistry courses, and also biology and general science. Graph 1 depicts the science courses offered in the 855 high schools. It will be seen that 96.5 per cent offered biology courses; 86.8 per cent, general science; 74.5 per cent, chemistry; 71.0 per cent physics, and 23.2 per cent, other science courses. "Other" courses were principally physical science, advanced general science, and physiology.

Graph 2 shows the percentage of students enrolled in traditional science courses in the 855 high schools. Almost two-thirds (63.7 per cent) of the students were taking one or more science subjects last year. Graph 3 shows the grade level at which students were taking a particular science course.

Here are some specific findings in the seven-state study:

Rooms Used for Science Instruction (in four enrollment categories in the 855 schools in 1958-59): For 1 to 199 students, 1.2 rooms; for 200 to 499 students, 2.0 rooms; for 500 to 999 students, 3.3 rooms; for 1000 or more students, 6.8 rooms.

Types of Rooms: Most prevalent, combination classroom-laboratory for teaching one science subject or combination classroom-laboratory for teaching two or more science subjects; regular classrooms, 20 per cent; least prevalent, separate classroom and laboratory designed for a single subject and regular classroom equipped with movable lecture and demonstration tables.

Presentation Facilities in Science Classrooms: Ninety per cent or more of the high schools had chalkboards, A.C. electric outlets, picture projection equipment, running water, bulletin board, lecture-demonstration desk, and gas outlet. Fewer than 30 per cent had science rooms containing elevated seating or elevated lecture-demonstration desk, D.C. electric outlets, and compressed air outlets.

Facilities in Laboratories: From 70 to 90 per cent had A.C. electric outlets, storage cupboards, gas outlets on each desk, running water and a sink or trough on each table or desk, separate storage-supply rooms, and student equipment lockers. Between 50 and 70 per cent had a window and wall shelves, running water in laboratories but not on desk or table, reagent and/or storage shelves, and fume hoods. Less than 25 per cent had D.C. electrical outlets and compressed air outlets.

Lighting and Ventilation: Most of the schools had adequate lighting and ventilation in both science classrooms and laboratories, in the opinion of the survey teams.

Stockroom-Storage Facilities: Adequate in 65 per cent of schools.

Laboratory Space for Students: Adequate in 46.6 per cent of schools.

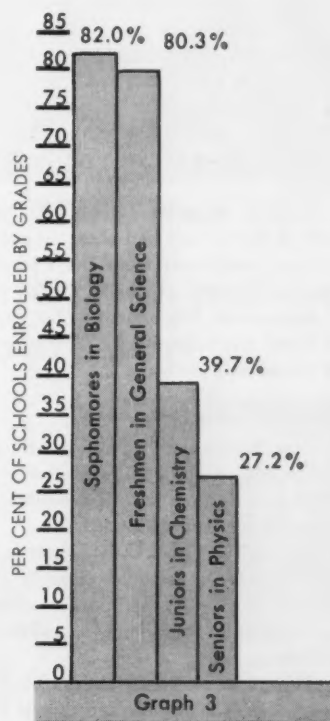
Ratings. Over-all science equipment ratings made by the state committees were reported in this order: chemistry, fair plus; general science, fair; biology, fair minus; physics, poor.

Budgeting for Equipment: Of the 855 schools, 58.9 per cent had annual budgets specifically earmarked for science equipment, equipment being defined as items that can be used over and over again. The total funds provided by these budgets in 1958-59 amounted to \$451,358, or an average of almost \$900 for the 503 schools. Compared with the 1957-58 budgets, the 1958-59 budgets represented an

increase for 51.3 per cent of the schools; no change for 32.8 per cent, and a decrease for 15.9 per cent.

Budgeting for Supplies: Of the 855 schools, 51.9 per cent had 1958-59 budgets for supplies (consumable items). These made available a total of \$169,488, or an average of \$382 for the 443 schools. Compared with the 1957-58 allotment, the 1958-59 budgets represented an increase for 39 per cent of the schools; no change for 49 per cent; a decrease for 12 per cent of the schools.

(Continued on Next Page)



GRADE LEVELS. Graph shows grade levels at which students study each science course offered in 855 schools.

Combined Budgets for Equipment and Supplies: For 1958-59 funds available to the schools with budgets totaled \$620,846. Divided by the 233,544 science students, this averaged out at \$2.66 available per science student. Reported by enrollment categories the figures were: from 1 to 199 students, \$3.90 per student; from 200 to 499, \$2.88; from 500 to 999, \$2.50; 1000 and more, \$2.26.

Out-of-School Funds: Of the schools studied, 7.6 per cent received funds for the purchase of science equipment and supplies from local P.T.A.'s; almost 3.4 per cent received such aid from interested parents, citizens, local industry, colleges, and school benefit programs and parties. Other minor sources of funds were service clubs, hospitals, doctors' offices, admission receipts from exhibits and science fairs, and local scientific societies.

Purchasing Practices

Procurement Procedures: Most frequently, orders were placed by the science teachers with the superintendent and central purchasing agency consummating the transaction.

Pooled Orders: Only 9.4 per cent of high school science teachers grouped their orders and submitted them for competitive bids.

Direct Orders: In 15.8 per cent of the schools science teachers were permitted to order directly from supply houses.

F.S.P.A. Program: About 30 per cent of the schools had obtained some science equipment from the Federal Surplus Property Administration.

Improvised Equipment: This type of items was utilized by 57.7 per cent of the schools studied.

Maintenance Practices

New Equipment: About two-thirds of the schools had equipment that was fairly new or more new than outdated; it was being well maintained.

Setting-Up Time: Only 34 per cent of the schools provided time in the science teacher's schedule for setting up equipment for laboratory and demonstration work.

Maintenance Time: Only 18.1 per cent of the schools allowed time in the science teacher's schedule for maintenance and care of equipment, yet equipment was well maintained in 40 per cent of the schools.

Only 52.3 per cent of the high schools kept inventories of science equipment and supplies. Inventories taken by members of the state committee were utilized to determine the number of items available per school, per classroom, and per student in science.

Analysis of Equipment Use: Considerable variation was noted in the quantity of science equipment available and the number of science students per unit in the various sizes of high schools. As the size of the schools increased, the variety of items and the number of each item also increased. Even though the large schools had a greater number of science students per item of equipment than the small schools, they had several class sections of each science subject, so the net number of students per item decreased substantially as the school size increased.

An example illustrating the interpretation of inventory data follows: In the 257 high schools having enrollments of 200 to 499, the equivalent of 960 biology students was deprived of firsthand classroom experience with a microscope. As the size of the high school increased, the average number of microscopes per school also increased; so did the gross number of students per microscope, except for a slight decrease in the 1000 or more students category.

On the other hand, the number of students per microscope was the lowest in the largest schools. Student microscopes were lacking in a higher per cent of the smaller high schools than in the larger ones. Except for the smallest schools, the number of students deprived of contact with this instrument decreased substantially as school size increased. About one-twelfth of the biology students were in schools not having a microscope for their use.

Semi-Micro Equipment: This was available in only 10.2 per cent of the 636 high schools offering chemistry during the 1958-59 academic year.

Tools: Very few science departments had an adequate assortment. The supply in sample schools was such that from one-fourth to one-third of the schools might have had a table vice, hand saw, hack saw and crescent wrench. From one-half to two-thirds might have had a wire cutter and hammer. Four-fifths might have had a

pair of pliers. All of the schools had a screwdriver.

A considerable variation was noted in the quantity of science equipment available and the number of students per unit in the various sizes of high schools. Yet a greater portion of high school students is studying sciences today than three years ago.

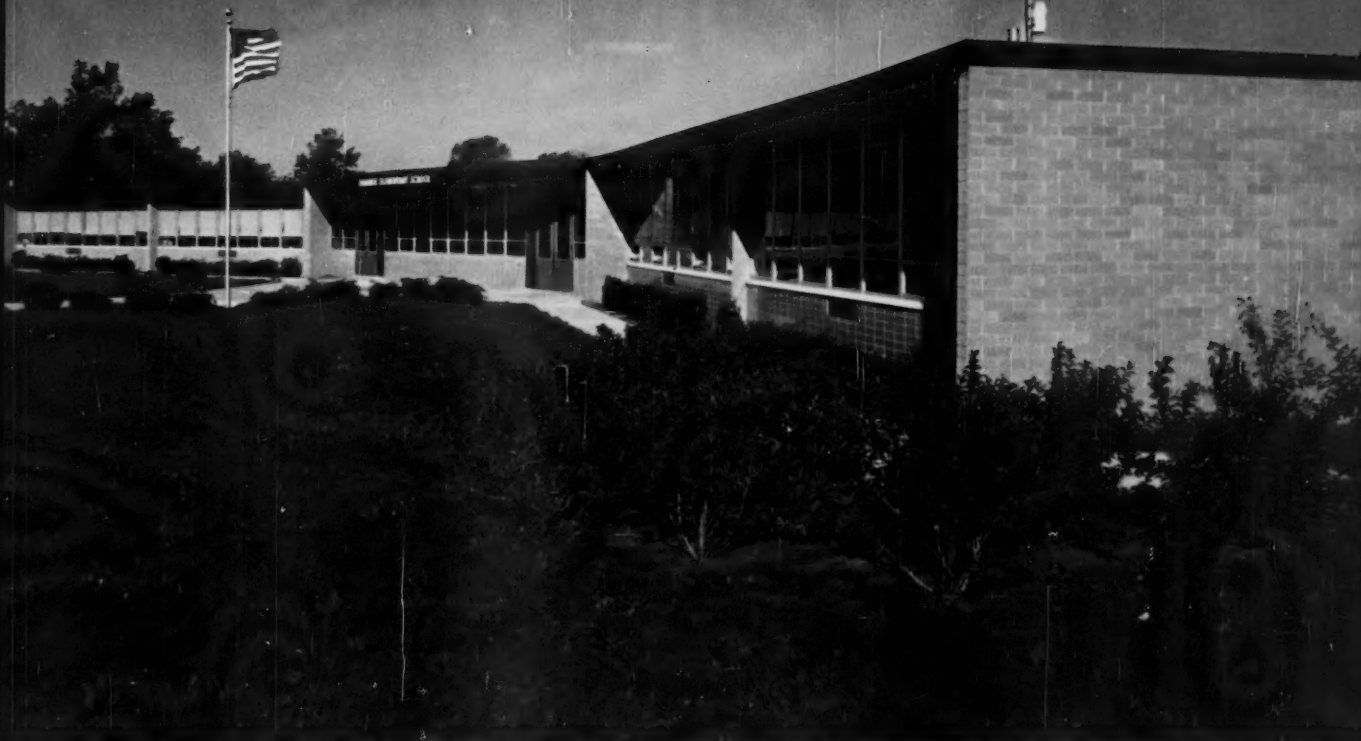
Roughly one-half of the high schools studied lacked adequate space for laboratory work, and one-third of them lacked proper science equipment storage facilities. The location of science classrooms and laboratories is such that minor enlargements and modernization are feasible in about one-half of the schools. Storage space is at a premium.

As conventional fuels and the Iron Age give way to the Atomic and Space Era, can the American people, the elected school board members, and the school administrators expect science programs to keep abreast of the times when annual budgets are provided in only 59 per cent of the high schools; when the amounts provided in one-half of the schools in 1958-59 represented no change or a decrease from the preceding year, and when about one-fifth of the schools require science students to pay breakage and laboratory fees?

Science teachers should be able to depend upon an appropriate amount of money each year for the procurement of equipment and supplies. This would permit long-range planning and a steady improvement in the variety and quantity of laboratory and other instructional equipment. A guaranteed basic allotment per science student is one effective way by which projected budgets can be estimated. A change in purchasing procedures could result in a more efficient use of available science funds.

Many investigators, including James B. Conant, indicate that schools enrolling fewer than 500 students cannot offer the educational opportunities present in the larger schools. Every effort should be made, therefore, to bring about consolidation of small high school districts, thereby broadening the base for adequate financing of the total school program, including science education. ■

Copies of the complete report can be obtained by writing to the Research Foundation, University of Toledo, Toledo 6, Ohio. Send 25 cents in coin to cover mailing costs.



View of the modern Ivanhoe Elementary School in Gary, Indiana, showing its walls of Natco Uniwall. The buff colored vertical walls show Uniwall's exterior rugg-tex finish. The light green panels under windows show a unique use of Uniwall's interior face installed in reverse. Architect: Jos. P. Martin & Assoc.

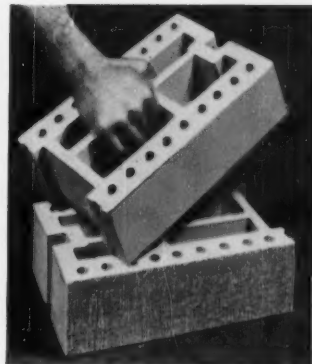
**Inside and outside walls of this modern school
were built with one unit in one operation
... with "double-duty" Natco Uniwall**

The Ivanhoe Elementary School in Gary, Indiana, is one of the forerunners of a new and functional type of building construction. Its walls are completely built of Natco Uniwall.

Uniwall is a single structural clay tile unit with two faces. Its *exterior* face has an unglazed rugg-tex finish that gives the appearance of high-quality brick. Its *interior* face has a durable ceramic glazed finish and is available in a variety of attractive colors.

"Laying up" both inside and outside walls in a single operation not only saves time, but also saves labor costs . . . when compared with other building methods.

Uniwall has excellent insulating qualities, is completely fireproof, is easily maintained and is durable. Consider modern, functional Natco Uniwall for your next building job. Write for catalog UW100-5.



Nominal Uniwall face size: 3 $\frac{3}{4}$ " x 11 $\frac{1}{2}$ "
Thickness: 7 $\frac{3}{4}$ "

Today's idea becomes tomorrow's showplace . . . when Natco structural clay products are in the picture

natco corporation

GENERAL OFFICES: 327 Fifth Avenue, Pittsburgh 22, Pennsylvania . . . Branch Offices:
Boston • Chicago • Detroit • Houston • New York • Philadelphia • Pittsburgh • Syracuse
Birmingham, Alabama • Brazil, Indiana . . . IN CANADA: Natco Clay Products Limited, Toronto

"Keysort Punched Cards give our school fast, effective, low-cost programming and objective grade reporting"



Says Principal Anthony Matulis of Taylor Center High School, Taylor, Michigan

STUDENT PROGRAM & REGISTRATION SET
TAYLOR CENTER HIGH SCHOOL
Taylor, Michigan

NAME: John A. Roberts, Jr.
M Oen 12 489

SUBJECT	TEACHER
1 ENGLISH 9	J. SMITH
2 SERIAL SCIENCES 24	T. LEE
4 ALGEBRA 45	H. THOMPSON
6 GEN. SCIENCE 20	R. HENRY
7 PHYSICAL ED.	
3 STUDY	24
3 STUDY	40

HOME ROOM TEACHER: MISS K. MEYER
FATHER'S NAME: JOHN ROBERTS
MOTHER'S NAME: LYDIA ROBERTS
FAMILY PHONE: DR. R. JAMES
CHOREAU

DATE: FEB 15, 1942
PLACE OF BIRTH: DETROIT, MICH.
AGE: 17
GRADE: 12

SUBJECT REPORT CARD

NAME: John A. Roberts, Jr.
M Oen 12 489

GRADE	EXPLANATION
English 9	12
John Smith	15
William Anderson	5

1. "With Keysort, we schedule 75% faster than with the tally system." Student-oriented fine scheduling is far faster, more effective.

2. "With Keysort, we test for all subject conflicts in just one hour." Conflict-testing is done without annoying, time-consuming trial and error.

3. "Keysort allows us three aptitude groupings for every major subject." Placing students according to aptitude and achievement is physically and economically possible.

4. "Before Keysort, we had an error factor of 50-100 students per subject." Errors in scheduling are eliminated, troublesome platooning ended.

5. "15 minutes after cards reach Attendance Office, our absentee list is finished." Strict attendance control is another by-product of the system.

6. "Keysort assures our students of objective grade reports for each subject." Teachers mark independently on individualized report cards.

7. "Keysort report cards are saving 6 teaching days a year for each of 60 teachers." Valuable teaching time is preserved for your staff and your students.

8. "Keysort has drastically cut our clerical workload." Keysort puts clerical work in the office—where it belongs.

9. "Keysort edge-notching permits fast, simple processing." Keysort procedures require no complicated machinery, no special training.

10. "All Keysort forms and cards fit well within our school's budget." Keysort is available at a cost that will surprise you—and your Board.

For a detailed report on Principal Anthony Matulis' use of Keysort, write today to Royal McBee Corporation, Data Processing Division, Port Chester, N. Y.

ROYAL MCBEE · data processing division

NEW CONCEPTS IN PRACTICAL OFFICE AUTOMATION

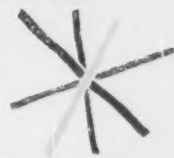
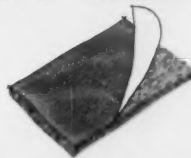


New Cork-Tex® bulletin board can take it!

You're looking at Cork-Tex®, the first bulletin board that combines the brilliant color possibilities of vinyl with the rapid healing properties of genuine cork. You choose the precise vinyl color and pattern that blends with your interior scheme.

And Cork-Tex® can take it! The resilient, unadulterated cork body pushes the vinyl cover back into place after tacks or pins (even scout knives!) are removed. No visible scars...Cork-Tex® stays looking as new as the day it was installed.

More good news: on-the-wall costs are lower than for many "substitute" materials, and maintenance-free Cork-Tex® wipes clean with mild soap and water.



The Cork-Tex® secret: Special adhesive permanently bonds unadulterated cork sheet to handsome, longer-lasting vinyl cover.

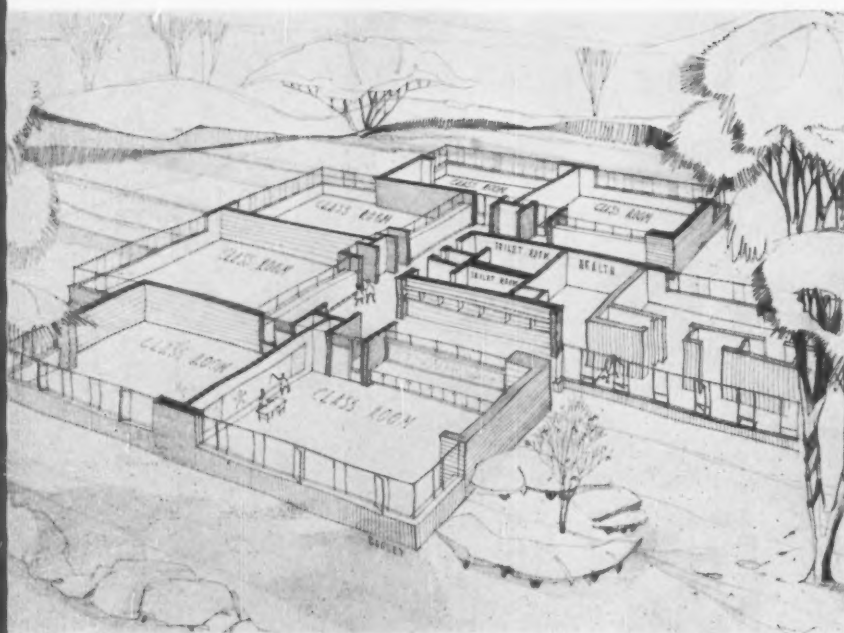
Many colors in stock. Write us and we'll have the nearest distributor contact you. He'll show you color swatches and price lists.

BOND CROWN & CORK

DIVISION OF

CONTINENTAL CAN COMPANY

WRITE FOR FULL INFORMATION: Bond Crown & Cork, Dept. D, 1819 N. Major Ave., Chicago 39, Ill.



SINGLE CLUSTER of the new elementary school in Rapid City, S.D., shows six classrooms, two lavatories, a janitors room, and a health area. Architects are Perkins and Will of Chicago.

Cluster Plan Fits Rapid City's Needs

This article is based on an interview with Paul C. Stevens, superintendent of schools in Rapid City, S.D.

WHEN their new elementary school is dedicated, the people of Rapid City, S.D., will be sending their children to a group of separate little schools that represent a community-endorsed version of the cluster plan.

How does the *cluster plan* work? What makes it good — or bad? Rapid City demanded answers to these questions when it chose this plan for a school as yet unnamed and still in the construction stage.

Two committees, one composed of educators,* and the other of community representatives of building trades, with Merle A. Stoneman, professor of school administration at the University of Nebraska serving as educational consultant for both, asked the archi-

itects to submit three separate plans.

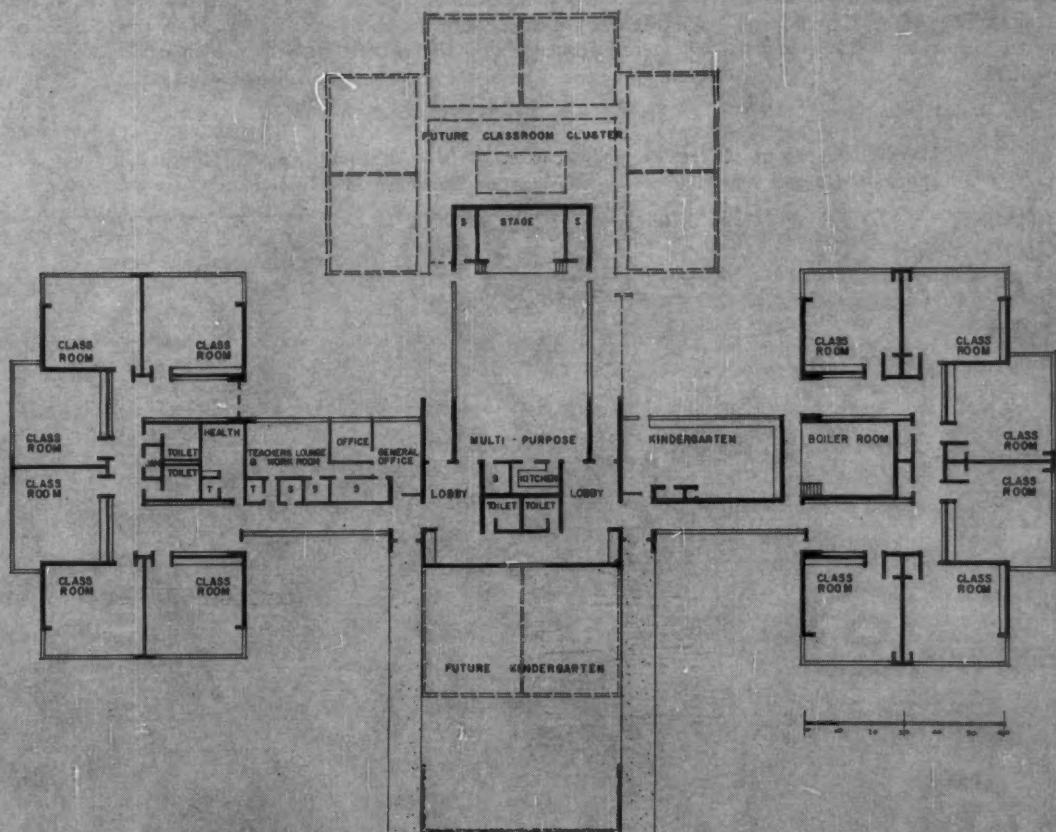
The architects, Perkins & Will, Chicago, and Aukerman & Mazourek, associate architects, Rapid City, submitted these plans: Plan A, basically a double-loaded corridor; Plan B, a single-loaded corridor, and Plan C, a cluster. After the two committees had studied and considered these plans, each cast its vote in favor of the cluster plan.

In recommending the cluster plan, the architects directed attention to the expansion possibilities it offered. They cited Rapid City's fast growing popula-

*Membership was selected by the superintendent's cabinet. Serving on the committee were two elementary principals, the supervisor of elementary education, the assistant superintendent, the director of public information, and two elementary teachers.

SCHOOLHOUSE PLANNING

PROVISIONS for a future classroom cluster and kindergarten are shown in this floor plan (below) of Rapid City's new elementary school. The possibilities for expansion with a minimum of expense was a major reason for selecting the cluster plan. And Rapid City may need to expand this building because there is no indication that the peak in school enrollment has been reached.



tion since World War II, with no indication that the peak in school enrollment has been reached. They also reminded the committees that additional clusters, included as part of the original planning for the future, can be added with a minimum of expense.

Further, the architects said, the cluster plan is "intimate" and gives the child identity. It doesn't have the "forbidding look and environment" of a more conventional plan. They also advised the committees that the cluster plan's simplified construction results in a lower initial cost and that danger from fire is reduced by the diversified plan.

In making its recommendation, the educational committee considered the grade separation made possible by the cluster plan of great assistance in the instructional program. (See plan on page 115.) Each group has its own play area. All groups use the same multipurpose room for indoor play and for creative activities that require more space than the classrooms afford.

Supt. Paul C. Stevens believes that the children in each cluster will be a more closely knit group, sharing like interests. They will have the advantages of facilities afforded by a larger school while enjoying a smaller school atmosphere.

Also influencing the educational committee's vote for the cluster plan is the placement of rooms and corridors, which permits easy movement of children. When children in one cluster, or even in one classroom within the cluster, are required to leave the room in a group, they can do so with a minimum of disturbance.

The citizens committee was composed of a contractor, a construction engineer, a consulting engineer, a plumbing contractor, a construction superintendent, an electrical contractor, a representative of the painters, and the manager of the Rapid City Builders' Exchange. In arriving at similar conclusions, the citizens group also was impressed by what the cluster plan offers in grade separation and sheltered play areas. Too, it admired the good appearance of the building despite the number of clusters, and regarded the cluster design for schools as "advanced educational and architectural thinking."

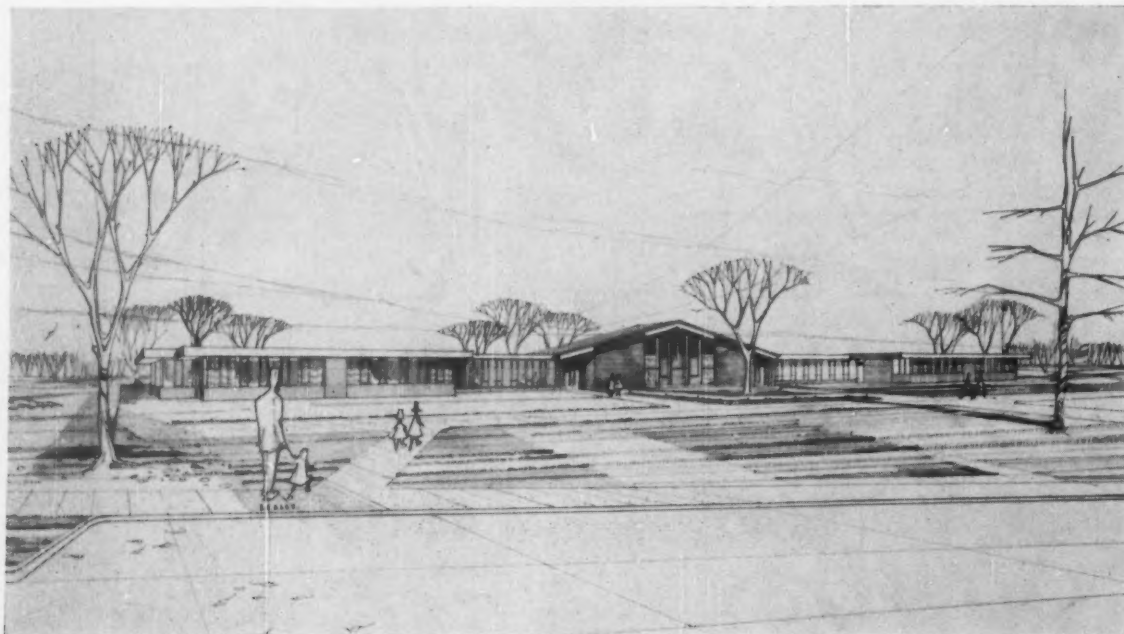
"This last point is most important," Supt. Stevens says. "We often underestimate the desires of a community to go beyond the traditional concept of architectural and educational planning. It was a pleasant surprise when all groups recommended the cluster plan."

Exterior walls of the school are face brick with dense concrete block backup. Interior partitions generally are concrete block with some face brick. Ceramic tile floors will be used in all toilet rooms and behind corridor drinking fountains. Structural glazed tile walls are specified for the toilets. Other floor surfaces will be asphalt tile, with vinyl asbestos being used in the kitchen.

From the recommendations and endorsements of the cluster plan given by the architects and the two committees, it might appear that this plan is the solution to all problems of school construction. This is not true, the architects are quick to point out. There are restrictions that should be considered along with advantages.

First, there is the matter of site. For most effective use of the cluster plan more land is required than for the same number of classrooms in more conventional plans. Not all sites will adapt to the cluster. Second, because of the small self-contained school atmosphere of the cluster plan, a teaching staff willing to accept more on-the-spot administrative responsibility is needed. It has been found, according to Rapid City school officials, that most teaching staffs welcome this challenge. — J.J.B. ■

LEARNING can be a pleasure when it takes place in a school like this. Notice the spaciousness and simplicity of the entrance as illustrated in this architects' sketch.



OVER A DECADE OF LANGUAGE LABORATORY EXPERIENCE

MRI



NEW

MAGNETIC DISC

New fidelity. Easiest to use, easiest to maintain. Indestructible, reuseable over and over again.

NEW

TAPE MAGAZINE

So easy to use! No threading errors. Simpler for both teacher and student.

only an **MRI** LANGUAGE LABORATORY

gives you unmatched simplicity-fidelity as never before

MRI—and only MRI—ranks simplicity with fidelity. These newest MRI advances continue to assure you maximum teaching effectiveness, whether your students record on conventional tape, the new MRI magazine, or the simplest of all methods, the MRI magnetic disc.

MRI services go far beyond technological leadership. Just as important—for teachers, too—are the “programming” and “results” aspects behind each installation. From its nationally conducted seminars, MRI has assembled basic facts concerning the most efficient utilization of electronic language

teaching equipment. Now MRI offers this vital information as a continuing educational service.

For 10 or 10,000 students... be the medium magnetic disc, magazine, or tape reels, you will find an MRI installation to exactly meet your needs and budget. And, as your program expands, MRI's Building Block Concept protects your investment by minimizing expansion and conversion costs.

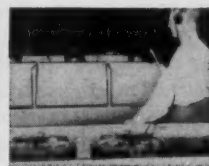
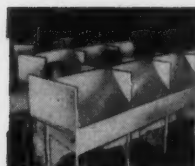
For complete information about MRI Language Laboratory Equipment and educational services, write or phone today.

MRI
MAGNETIC RECORDING INDUSTRIES

A SUBSIDIARY OF THOMPSON RAMO WOOLDRIDGE INC.

126 Fifth Avenue, New York 11 • ALgonquin 5-7250

MRI Language specialists available in your area for consultation.



Partners in Maintenance

*The story of a divided custodial service
with part of the work being done under contract*

GERALD W. BREKKE

Superintendent of Schools, Kennedy, Minn.
Formerly With Pleasant Valley School District, Camarillo, Calif.

ANY plan that promises to reduce the cost of a school service by as much as one-fourth deserves administrative exploration. This is the conviction of Charles Honn, superintendent of Pleasant Valley School District, Camarillo, Calif., following two years of experience with a partnership type of school maintenance program.

Pleasant Valley has achieved major financial and administrative benefits by utilizing the services of a professional cleaning firm in combination with the district's own custodial employees. The school staff maintains the offices, library, cafeteria and grounds, while the private operator provides daily cleaning and custodial functions in classrooms, halls and lavatories.

The first year under the cooperative arrangement the district's outlay for custodial services was reduced by 28 per cent. During the second year weekly cleaning of the auditorium and kitchen and of an eight-room school was added to the schedule. "We are very happy with the service arrangement and are planning to continue the program for the third year," Superintendent Honn reports.

Over-all advantages realized under the dual custodial plan include the following:

1. Recruiting, training and supervision have been virtually eliminated. Previously the task of employing competent janitorial help, in competition with the rapidly expanding defense installations of the area, equalled or exceeded that of obtaining competent teachers. The contract was signed

after the district found it necessary to seek the 12th replacement in less than two years.

2. Finding full-time employment for a full school staff during the summer months no longer is a problem. Since the district has no financial responsibility to the contractor during the months when school is not in session, savings accrue. At the same time the school's reduced staff can be employed the year round and utilized more effectively.

3. Cleaning efficiency has improved. Rigid job specifications and supervision requirements written into the contract, the methods and equipment used by the contractor, and the highly trained personnel have been responsible for better results than those achieved by traditional procedures. Teachers, asked to appraise the two types of programs, rated 10 of 11 services as performed in a superior manner under the contract plan, with an overall advantage of 10 per cent.

4. Economies are being realized. The contractor provides his own cleaning equipment, materials and supplies, which have been purchased in volume at prices that the district would find it difficult to duplicate. Use of special equipment enables the contract personnel to cover an unusual amount of square footage of floor space daily. The larger staff allows for division of labor, with specific crews moving with almost assembly line precision from one job to another and specializing in one task each.

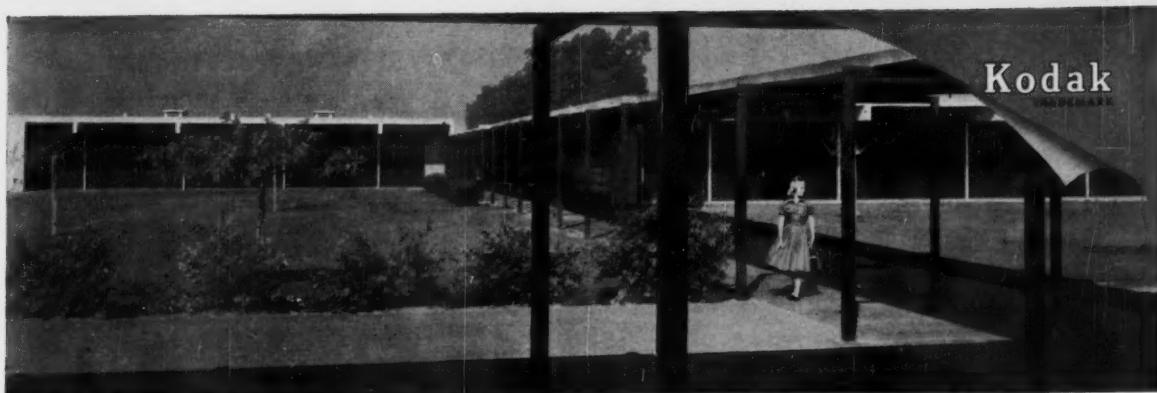
5. Administration and clerical time has been reduced. Under the partnership arrangement, time required for record keeping and supervision of the program has been more than halved. Formerly the school district had difficulty attracting competent janitorial applicants. Now the contractor frequently has a large reservoir of unplaced persons.

6. Budget estimating can be done more scientifically. Since the cost of the contracted work is determined by the contractor's bid, the total year's requirements for custodial services can be gauged accurately.

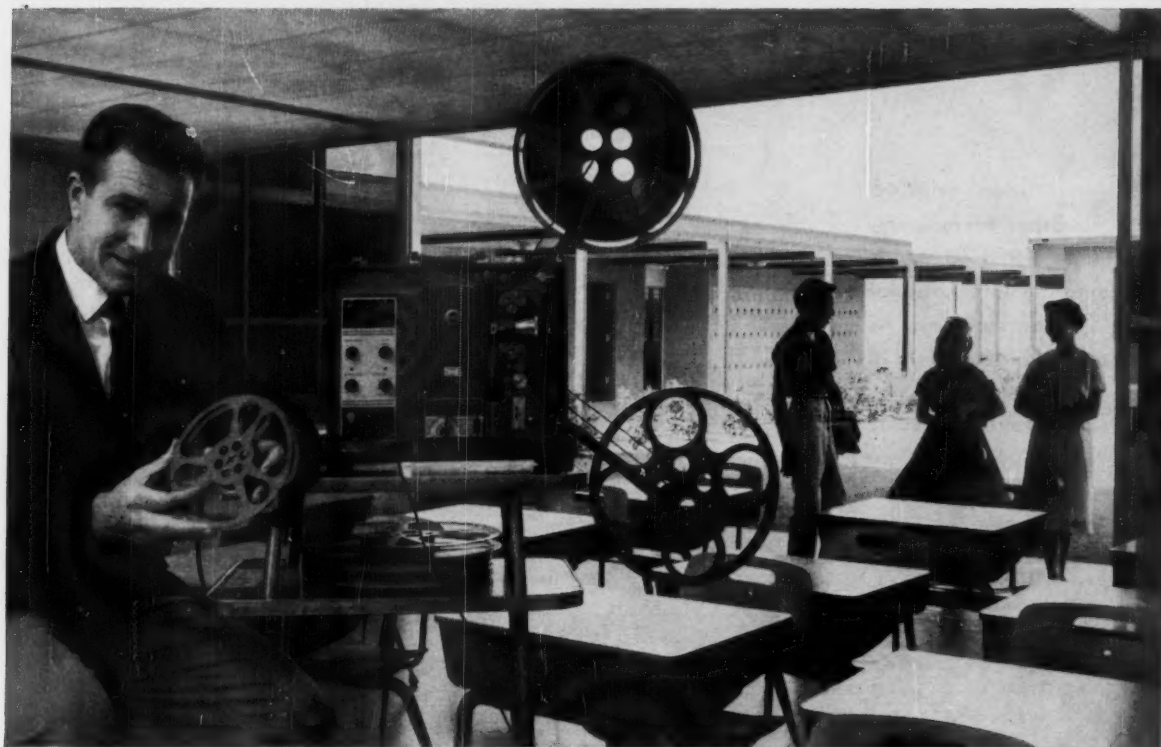
Superintendent Honn highly recommends the contract procedure and believes other schools could benefit from the experience of Pleasant Valley.

The firm with which Pleasant Valley entered into contract is a licensed and insured firm. It has earned an excellent reputation for fine quality of work performed in more than 100 industrial, commercial and professional buildings and offices in the area. Usually in any city several janitorial contracting firms are equipped to do large-scale cleaning in public schools.

While opportunities exist for extending the partnership principle in the school custodial field, a nucleus of school employed personnel always will be needed, Superintendent Honn believes. A school crew will be required as site custodians, maintenance men, and to take care of daytime emergencies that not even the best regulated system can anticipate. ■



At the Alamitos Intermediate School, Garden Grove, California, selected by the A.A.S.A. for its exhibit of outstanding school designs, John A. R. Reed, Principal, says:



"Even in these 'outdoor' classrooms, showing movies is no problem with our Pageant Projectors."

"Fresh air and sunshine belong in the classroom. So we built our school around patios, using big, tinted windows and sliding doors in every room. But even without blinds, our Pageant Projectors provide brilliant, detail-filled movies."

Looking for a way to end washed out movies, even in hard-to-darken areas? Then try the Kodak Pageant 16mm Sound Projector. You'll get brilliant screen images because the Pageant's Super-40 Shut-

ter puts 40% more light on the screen than an ordinary shutter at sound speed. Take the portable Pageant anywhere. Set up in minutes. And you're ready to roll with a show that takes full advantage of the impact of sound films.

Any Kodak AV Dealer will demonstrate the Kodak Pageant Projector in your school, at your convenience. Or you can get full details by writing for Bulletin V3-22.



Kodak Pageant Projector

EASTMAN KODAK COMPANY, Dept. 8-V, Rochester 4, N. Y.

Jane Writes to The Nation's Schools

When I first arrived in Holland, I wondered where all the wooden shoes and windmills were. I finally came to my senses and realized that Holland is much more than wooden shoes and windmills.

The entire country is very beautiful. I can say this for I have traveled over almost all of it. Holland looks very small on the map, but when one is here it is not hard to see how wisely the land of Holland is used. Not a bit of it is wasted.

The people are most wonderful. Take my Dutch family, for instance. I don't feel uneasy with them at all. We do many things together, and it seems as if I had been here for years, not months.

At school the teen-agers have made me a real member of the group. They all speak English very well, but most of the time we talk in Dutch.

There is nothing I dislike about being an exchange student. I agree with my parents in saying that, if through young people's exchanges world peace can be brought about, everyone should be an exchange student. I am trying my best to be an ambassador of good will from America.—JANE L. GOTTFRIED.

Along with 45 other teen-agers, Jane Gottfried, 16, is promoting international understanding. As an exchange student in The Netherlands, she takes seriously her role as a representative of America.



STUDENTS in The Netherlands seem amused at the manner in which Jane Gottfried (third from right) takes notes. Jane is an exchange student at Hymens Lyceum (high school) in Groningen, the northernmost province.

Our Daughter Is an 'Ambassador'

F. J. GOTTFRIED

Superintendent of Schools
Elyria, Ohio

OUR daughter is an exchange student in The Netherlands. She is taking her 11th grade courses at Hymens Lyceum (high school) in Groningen, the country's northernmost province. The daughter of the family in Harem with whom Jane is living is attending our high school in Elyria and has fitted herself into an American home.

At the end of almost a year, Jane will be back home — a lot wiser about the world. And one small portion of the world may be a little wiser about the United States, for Jane writes that she is "trying her best to be an ambassador of good will from America."

A parent has mixed feelings as he sees a 16 year old sail away with 45 other boys and girls of high school age to take a long leave from home and community. Most of these teen-agers were going to live and study in West Germany.

The TSS New York on which Jane sailed had brought 106 European youngsters to the United States the day before, under the sponsorship of International Youth Exchange, an organization with which several Protestant church groups are affiliated. The two sets of youngsters had one day together at Pennington School in New Jersey, which serves as an orientation center.

In our daughter's case, the First Congregational Church in Elyria is sponsoring the two-way exchange, with a cash outlay of \$1200. This amount covers the round trip voyages of the two students, an orientation session of 10 days' duration, and part of the expenses of the host families. The parents of the exchange students provide the many extras incidental to a year's stay abroad, including clothing and transportation within the country visited, as well as the procuring of a passport, photographs and luggage.

Our daughter's preparation for the year abroad included visits to many local industries and points of interest, so that she might be a better informed ambassador of good will. She started writing letters before the ship anchored at Bremerhaven, Germany, and through her correspondence is keeping many hometown people well informed on life in Europe.

Studies Foreign Languages

Learning foreign languages is an important part of this exchange program. Jane is studying Dutch, French, Spanish and English in high school over there, with Dutch becoming her spoken language. She is also learning a great deal about the government, local and national history, and ways of living in that delightful country. Re-

cently, through the U.S. State Department and the efforts of the local Dutch committee, Jane visited the Hague, saw the queen, and attended a session of the Dutch Parliament. Many such experiences will be hers during this year abroad.

Must Be 'Sold' on Trip Abroad

As parents, we are not ready to evaluate the exchange program, for scarcely half the year has elapsed. But we recognized the values to be gained before our daughter was finally chosen to represent her church and this community on the bases of scholarship, character, maturity and adaptability. It appears important to the success of the program that the student herself be completely sold on the prospects of a year abroad, away from everything important to teen-agers back home. The differences in ways of living, transportation, schools and their operation, all tend to test the mettle of the student.

In a world of jet planes and rapid communication, it seems as though understanding between the peoples of the world is becoming of greater importance each year. Through such efforts as this involving our daughter, we hope that our nation and our world will have come a little closer to the goal of world peace. ■

Why School Boards Need Legal Counsel

LEE. O. GARBER

Director, Educational Service Bureau, University of Pennsylvania

A SCHOOL board that fails to employ an attorney may find itself operating in a legal vacuum, and the result may be costly or even disastrous. The importance and value of employing competent legal assistance are illustrated by a recent Texas case.*

This was an action brought by the state of Texas against six members of the seven-man school board of the Tabasco Consolidated Independent School District, seeking to remove them from office because of their failure to place or print the name of Hamp Edwards on a ballot for a school board election.

The case was heard by a jury in the lower court, and, based upon its verdict, the court removed the trustees from office. They, in turn, appealed, and the lower court's decision then was reversed.

Board Obtains Legal Advice

Evidence indicated that the board first decided to leave the name of Hamp Edwards off the ballot because he failed to file a loyalty oath. Later he discovered this omission and filed his loyalty affidavit. Then the board decided to obtain legal advice.

There appeared to be some dispute as to the advice given the board by its attorney, but it was clear that the appellants were under the impression, from the advice received, that while the tardy filing of the loyalty oath was not sufficient grounds for withholding Mr. Edwards' name from the ballot, there were other legal grounds for justifying its action. A previous action had been brought, and a writ of mandamus had been issued against the board requiring it to place Mr. Edwards' name on the ballot.

On advice of counsel, the board decided to appeal that judgment, but,

before it could be heard in the court of civil appeals, the question became moot, because the election had already been held, apparently. It was following this that this action was brought. It was, of course, too late for Mr. Edwards to get his name on the ballot, and the real question was whether the board had acted corruptly and willfully.

There was no statute specifying the form and substance of the application necessary to get one's name on the ballot for school trustee. One statute, however, did require that an application should be in writing, signed by the candidate, and duly acknowledged. It also provided that it should contain the county of his residence, postal address, age and occupation.

The statute under which the case was prosecuted provided for the removal of officers for, among other things, official misconduct, and was, for that reason, construed as penal in character. The plaintiffs, appellees here, contended that the defendants were guilty of violating a statute that made it a felony for an officer charged with the duty of preparing and printing a ballot to omit from the ballot the name of a candidate whose nomination had been certified to it.

No Evidence of Malice

The court rejected this contention because the names of none of the candidates involved had needed to be certified to the board. It ruled that the only possible charge that could be brought against the appellants was that they were charged by law with preparing the ballot and having it printed and that they willfully and corruptly refused to have plaintiff's name printed thereon after receiving a proper application so to do.

In commenting on this, however, the court recognized that the statute did not expressly make it the duty of

the board to receive applications and prepare the ballot. Only by implication could this duty be imputed to it. Consequently, it held the appellants not guilty of this charge on the ground that "before a public official should be removed from office for failure to perform a duty, the law should plainly enjoin such duty upon him." Even so, it was held that the record failed to show that the appellants had acted willfully and corruptly in the matter under consideration.

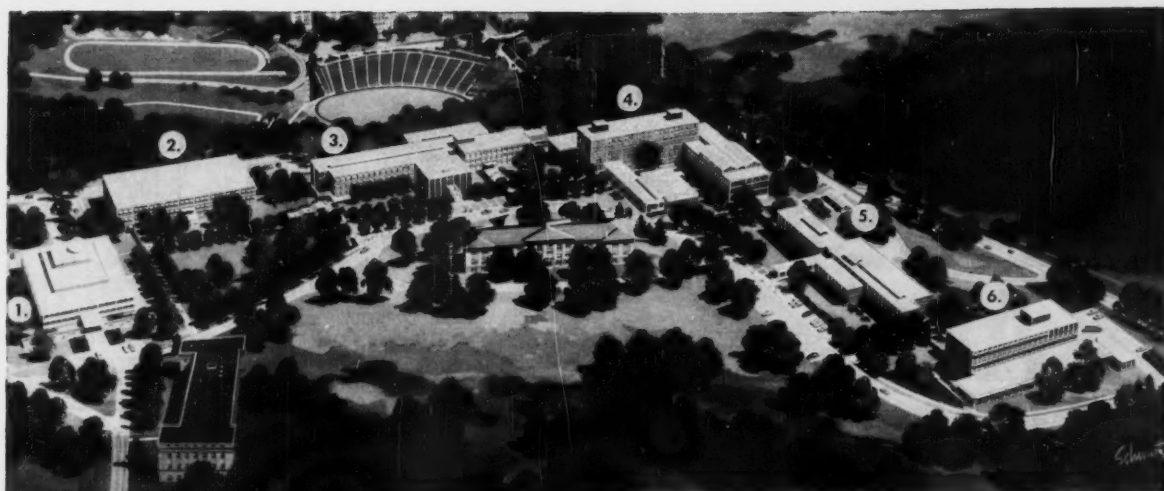
The court noted that there were two political parties in the Tabasco School District and that Mr. Edwards belonged to the opposite party from that of the appellants. While it might, therefore, be assumed that the unfriendly political attitude between the board and Mr. Edwards could, to some extent, have motivated the board, the court reasoned that it was not shown that the board had acted willfully or corruptly.

The court said: "Public officials are presumed to do their duty, and where as here a board of laymen sought a legal opinion from a reputable lawyer as to their duties under the circumstances, and then followed that legal opinion, they have not acted willfully or corruptly."

In commenting on this further, the court said: "It is clear that appellants . . . acted upon the advice of their counsel, and even though their counsel may have been mistaken in his legal opinion, appellants should not be subjected to the harsh remedy of removal from office, where they have sought and followed legal advice. Such conduct cannot be said to be willful and corrupt."

This case serves as a prime illustration of why school boards should make use of legal counsel. If they do so, and follow the advice given them, it will, at least, serve as evidence that they acted from proper motives. ■

**Reyna et al. v. The State of Texas ex rel. Hamp Edwards et al.*, 519 S.W. (2d) 28 (Texas).



Architects for the six new Science Center Buildings, University of Georgia; Abreu and Robeson, Aeck & Associates, and Toombs Amisano & Wells, Atlanta, Ga. General Contractors: Daniels Construction Co., Greenville, S. C. and Birmingham, Ala. H. W. Ivey Construction Co., Atlanta, Ga. Typical interiors of the Physics Building are shown at the left.

LEGEND

1. Physics Building
2. Mathematics, Geography and Geology Building
3. Chemistry Building
4. Biological Sciences Building
5. Animal Sciences Building
6. Food Technology Building

NEW UNIVERSITY OF GEORGIA SCIENCE CENTER is being completely equipped with KEWAUNEE-TECHNICAL LABORATORY FURNITURE AND EQUIPMENT



Working in the closest cooperation with the three Atlanta architectural firms and University officials, it was possible to plan for several economies resulting in impressive savings. This coordinated approach to integral building of science facilities well typifies the State of Georgia's forward approach to better education and modern living to better serve business and industry.

Send for our New Free 100 Page Catalog
(#58) on Wood Laboratory Equipment.

KEMTECH

KEWAUNEE TECHNICAL FURNITURE CO.
3004 WEST FRONT ST., STATESVILLE, N. C.

AFFILIATE OF KEWAUNEE MFG. CO., ADRIAN, MICHIGAN

BIG DIVIDENDS ARE BUILT INTO EVERY FORD SCHOOL BUS SAFETY CHASSIS

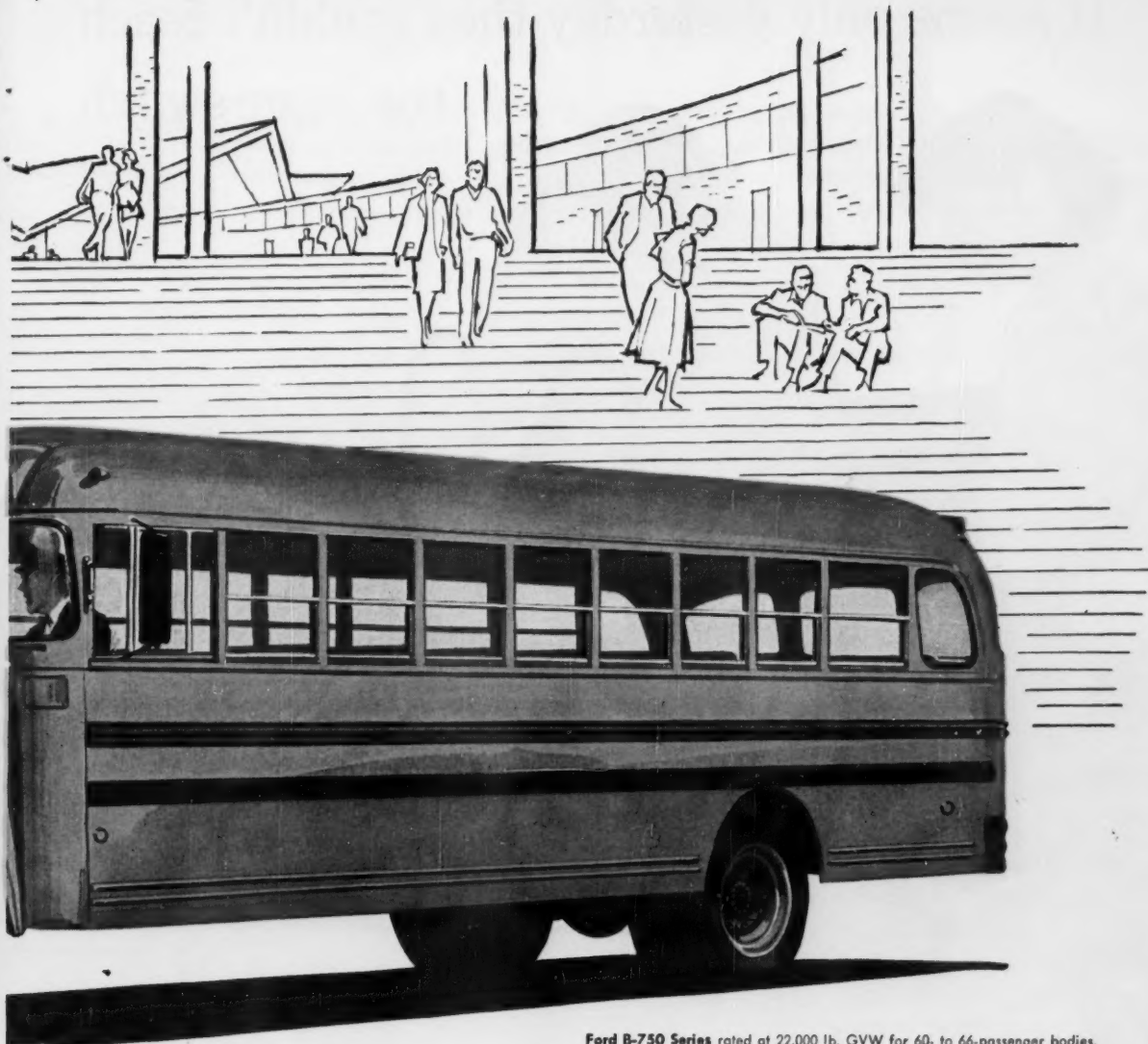


Ford's School Bus models, with economy features certified in tests by America's foremost independent automotive research organization, offer greater value for your transportation dollar than ever before. They're unsurpassed in safety and durability — put you 'way out front in long-lived economy with Ford's Short Stroke engines, refined to produce their outstanding power from even fewer gallons of regular gasoline.

You're money and miles ahead with a Ford School Bus Safety Chassis! You can choose the exact chassis capacity you need from Ford's four School Bus Series. They meet and often exceed the safety requirements of the National Education Association.

Strong, parallel, ladder-type frame in Ford's School Bus Safety Chassis provides the rigid base required to handle modern, large-capacity bodies safely. Channel reinforcements from front to rear springs add extra frame strength and safety to B-700 and B-750 models. Channel-type front bumper on all models is attached directly to frame for increased strength and rigidity. Component parts — axles, frames and springs — have the long-lived stamina, strength and durability you need for safer school bus operation.

And Ford offers a wide choice of key options to "custom tailor" a chassis to fit your exact requirements. New, higher capacity axles for the front and rear of most models plus larger brakes and



Ford B-750 Series rated at 22,000 lb. GVW for 60- to 66-passenger bodies. New 7,000-lb. front axle and 18,000-lb. rear axle with larger brakes optional.

bigger tires are available to provide that extra margin of safety. Ford School Bus Safety Chassis models offer a whole host of improvements to provide exceptional durability.

Stop in and visit your local Ford Dealer for complete details. Ask to see the "Certified Economy Book" — let him show you the kind of savings you can expect with a 1960 Ford School Bus in your operation.

FORD TRUCKS COST LESS

Less to Own . . . Less to Run . . . Built to Last Longer, too!

FREE **Mail this coupon today!**

FORD Division, FORD MOTOR COMPANY
P. O. Box 658, Dearborn, Michigan

Please send me your literature on the new
Ford School Bus Safety Chassis for 1960.

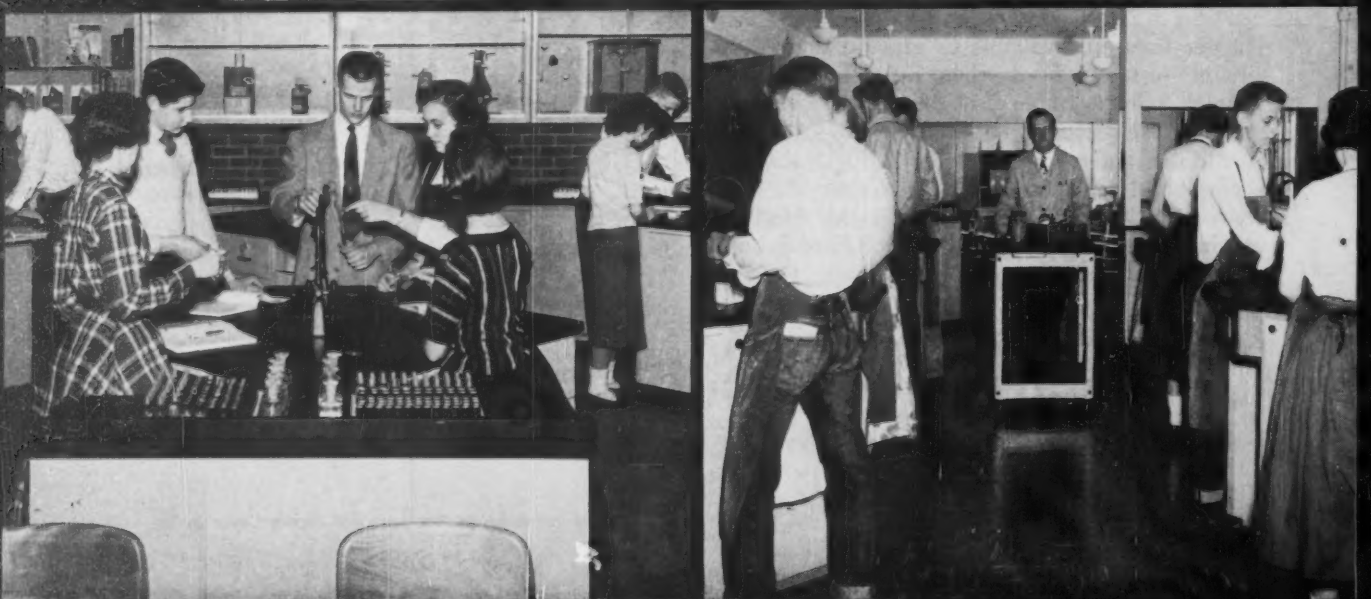
NAME _____

ADDRESS _____

CITY _____ STATE _____

Check here if student ☐

It seems only yesterday they couldn't reach
the light switch



... and today they hold the key to atomic energy. Science education has become a critical part of growing up, not just for future scientists but for all students. A thinking society will not thrust responsibility upon young people without preparing them. But there is so little time, and it passes so swiftly.

Educational facilities must be adequate for the teaching job that must be done.

Science furniture of old-fashioned design, no matter how new in construction, is still old-fashioned. It cannot equal in opportunity for achievement the modern facilities that Sheldon has created expressly to accommodate today's greatly expanded curriculum and to anticipate tomorrow's growth.

Sheldon science facilities are distinguished from conventional furniture by important differences in design and educational concept. These differences, which lead to greater teaching results, account for the preference for Sheldon among educators who know that genuine value in educational facilities is measured in terms of achievement.

E. H.

Sheldon

EQUIPMENT COMPANY

MUSKEGON, MICHIGAN

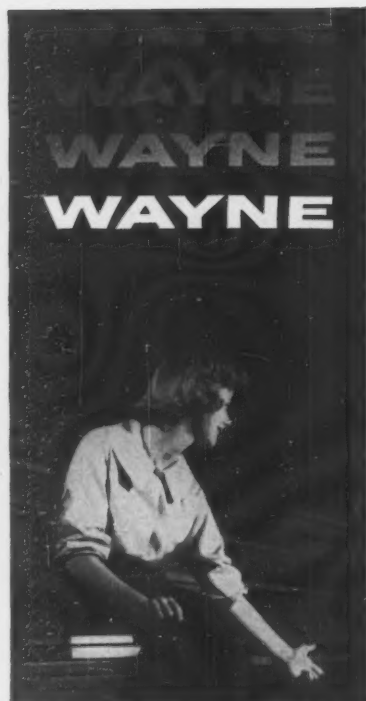
"Educationally Correct" Furniture

NEW FILM STRIP AVAILABLE ON LOAN. Presents the new Sheldon Junior Science Program. With 33 1/3 r.p.m. record. Write for reservation.

Visit Sheldon at Booth E-35-F-42, AASA Convention, Atlantic City, February 13-17



NEWS IN REVIEW



WAYNE INDOOR SEATING SYSTEMS

work wonders on any school budget



Hard-working Wayne Model 30 folding bleacher. Economy seating in the folding bleacher class.



Leader in luxury seating at a popular price. Wayne Model 50 Rolling Gymstand.



Deluxe Model 70 continuous rolling gymstand. Finest money can buy!



Only Wayne offers three basic types! More value, better engineering, finer performance in each... from the world's largest manufacturer of spectator seating. Write for big, all new 1960 catalog today.

WAYNE IRON WORKS • WAYNE, PA.

Chicago's Benjamin Willis Is A.A.S.A. President-Elect; Texan Irby Carruth Elected to Office of Vice President

WASHINGTON, D.C. — Benjamin C. Willis, general superintendent of Chicago public schools, is the new president-elect of the American Association of School Administrators. Final ballots were counted here on January 7 by the A.A.S.A. board of tellers.

Dr. Willis went to Chicago in 1953, after holding similar positions in Buffalo and Yonkers, N.Y. Born in Baltimore, he began his career as an educator in the historic Chesapeake Bay region, where for a quarter-century, beginning in 1922, he served in various Maryland communities as principal and superintendent before going to Yonkers, N.Y. He has been a member of The Nation's Schools editorial advisory board since 1953.

The new president-elect holds a Ph.D. degree from Columbia University. In 1955, Northwestern University conferred upon him an honorary LL.D. degree, and in 1959 he was awarded the honorary degree of Doctor of Humane Letters by Central Michigan University, Mount Pleasant. His A.B. degree is from George Washington University, and his M.A. from the University of Maryland.

Dr. Willis has long been regarded as one of America's most outspoken educators. In commenting on the critics' search for one educational program for all chil-



Benjamin C. Willis

dren, he made his often-quoted statement: "There is no American school system, but there are schools for American children. Each is different as it seeks to build a program of education which is unique and adaptable to the talents and ambitions of each child."

The other candidates for the office of
(Continued on Page 130)

Education Conference Supports Federal Aid

PONTIAC, MICH. — Federal tax resources must be made available to help support our educational system, agree 13 nationally known educators who held a three-day private conference with Gov. G. Mennen Williams here recently.

The participants considered at some length the possibilities of substantial reductions of the cost of education at every level. While they recognized the possibilities latent in the use of television, films and a variety of other experimental technics, they found no serious hope that the funds to finance the enormous needed expansion of our educational system could be diverted from present uses, stated a summary report.

Education needs an informed, aroused and organized public opinion to achieve the desired goals, the group agreed.

"There was general recognition of the central importance of the comprehensive high school as the instrument for offering equal additional opportunities appropriate to the individual needs and abilities

of each child. The group expressed concern over the pressure of some special interest groups to deny full educational opportunities to those elements that cannot or should not undertake a traditional academic program," the report said.

Participants in the conference included: Lynn M. Bartlett, Michigan superintendent of public instruction; the late Omer Carmichael, superintendent of schools, Louisville, Ky.; William G. Carr, executive secretary, N. E. A., and Edgar Fuller, executive secretary, Council of Chief State School Officers.

N.E.A. Releases TV Series: The School Story

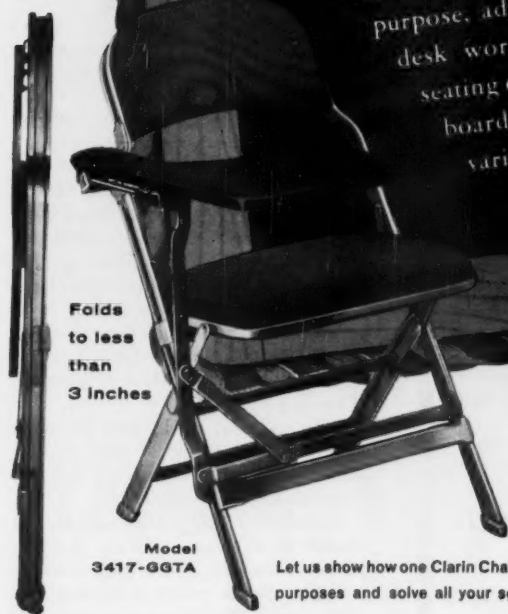
WASHINGTON, D.C. — The National Education Association has released a series of half-hour films for television entitled "The School Story."

This programming marks the first time that a national noncommercial television series has been "built around the problems, aims and achievements of education in this country," according to William G. Carr, executive secretary of N.E.A.

SAVE BIG MONEY

on auxiliary seating
WITH
Clarín Folding Chairs
GUARANTEED 10 FULL YEARS!

Throughout the country, schools, hospitals, churches and business have discovered new dimensions in efficient seating with Clarín folding chairs. Shown is one of our multi-purpose, adjustable Tablet Arm units designed for desk work, music room and normal classroom seating or for conferences, sales meetings, church board groups, etc. Upholstery and finishes in a variety of colors. Over 100 different models.



Folds
to less
than
3 inches

Model
3417-GGTA

Let us show how one Clarín Chair can serve three purposes and solve all your seating problems.

Write
... or mail
coupon

CLARIN MFG. CO., 4640 W. Harrison, Dept. 14 Chicago 44, ILL.

Without obligation, send complete information on Clarín Auxiliary Seating.

Firm Name _____

Street Address _____

City _____ Zone _____ State _____

Individual's Name _____

Pioneers in Auxiliary Seating. Est. 1925

TA

CLARIN Manufacturing Co., 4640 W. Harrison, Chicago 44, ILL.
VISIT US DURING NEA-AASA CONVENTION IN BOOTHS F51-53

Urges Teachers To Seek Intelligent Public Appraisal

TOLEDO, OHIO. — The nation's teachers were urged recently to seek aggressively "intelligent public appraisal" of the schools in order to improve quality in education.

Addressing the annual convention of the Ohio Education Association here, William G. Carr, executive secretary of the N.E.A., described seeking constructive criticism as "a duty of the profession second only to the duty of providing instruction."

"While some criticism is ill founded and some appraisal unfairly biased, we

have not fallen — and must not fall — into the habit of treating all appraisal as an attack," Dr. Carr declared. "When adverse comments about the schools are justified, the appropriate professional reaction is not fear or anger, but rather prompt remedial action," he said.

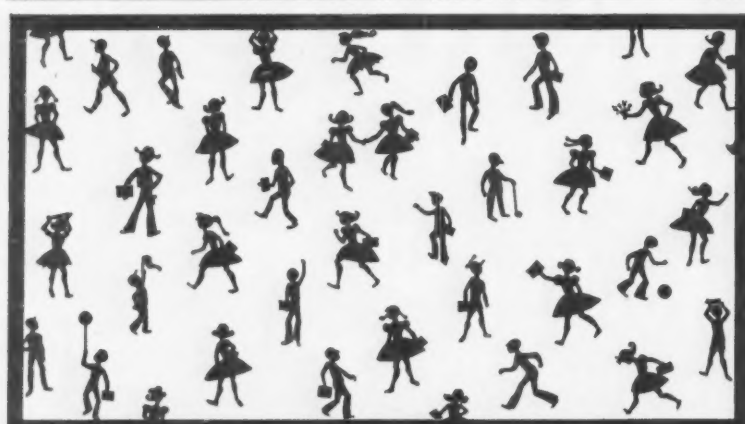
Billion in School Bonds Approved in Ohio in 15 Years

COLUMBUS, OHIO. — Ohio voters have approved four-fifths of all school bond issues submitted to ballot within the school districts of the state during the last 15 years, according to the Ohio State

University Bureau of Educational Research and Service. The bureau reported that the 2283 bond issues approved during that period totaled \$1,033,690,000.

Who's Got the Paddle?

NO SOONER had the Stamford, Conn., Board of Education approved the use of paddles as a disciplinary measure, than it confessed not knowing what kind of paddle to use or where to buy it. So it has asked all school principals to investigate the paddle situation and report to the board. Somebody recalled at a recent board meeting that a paddle hangs nailed to the wall in the office of Kermit R. Shulman, school psychologist. Upon examining the paddle, however, the board found it to be of the jokester variety and not at all feasible for getting to the seat of the problem. Mrs. Robert Dwyer, president of the Citizens' School League says she had been told that all schools already were supplied with paddles, but the board members, finding themselves higher and higher up the creek without a paddle, can't remember voting for funds to purchase them. ■



Acme Visible School Record Systems SIMPLIFY RECORD HANDLING TO KEEP PACE WITH RECORD ENROLLMENTS



**ACME TRAY
CABINETS**
Versatile file
controls individual
pupil records.



**COMPACT CLASS
RECORDS**
A complete class
record at a flip
of the finger.



**CLASS RECORD
CARD BOOKS**
Grades, enrollment,
vital statistics
at a glance.



**PREPRINTED
RECORD CARDS**
Easy to read cards
for all school
records and needs.

Turn paperwork . . . teacher's pet peeve, into teacher's pet! Simplify all your record handling problems simply by using Acme Visible School Records and Systems.

For instance, now on just one Acme Visible record card, a student's complete school record! Background, grades, test results, even attendance . . . available at a glance. No need for a half-dozen different cards requiring duplication of entries and a waste of teaching time.

Similar Acme Visible records simplify handling of teachers' records, payroll, purchasing and inventory, maintenance and service. These time and work saving records can help your school. Call your Acme Visible representative or mail coupon. There's no obligation.

ACME VISIBLE

World's Largest Exclusive Makers of Visible Record Systems

ACME VISIBLE RECORDS, Inc.
6402 West Allview Drive, Crozet, Va.

Send free literature on "Record Systems for Schools."

Name _____

Title _____

School _____

City _____ Zone _____ State _____

A.A.S.A. President-Elect

(Continued From Page 128)

president-elect were Alfred W. Beattie, superintendent of Allegheny County schools, Pittsburgh, and Evert W. Ardis, director of the bureau of appointments and occupational information at the University of Michigan, Ann Arbor.

Newly elected A.A.S.A. vice president is Irby B. Carruth, superintendent of schools in Austin, Tex., since 1950. He has held similar positions in Texas for the last 30 years. Dr. Carruth attended West Texas State College and received his M.A. from the University of Chicago. He holds an honorary LL.D. degree from Texas Christian University. He has been a member of The Nation's Schools editorial advisory board since October 1959.

Dr. Willis will take office as president of the A.A.S.A. on March 15, 1961, after completing his one-year term as president-elect. Dr. Carruth's term as vice president will be for one year and will begin on March 15 of this year.

Forrest E. Conner, superintendent of schools in St. Paul, was the A.A.S.A. president-elect during the past year. He will take office as president on March 15, 1960. Spencer W. Myers, superintendent of schools in Flint, Mich., is the new executive committee member.

When it comes to popularity...



No. 68-264
Masterkeyed



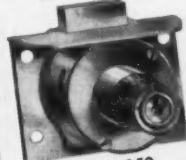
No. 68-265
Not Masterkeyed



No. 68-267
Masterkeyed



No. 68-271
Masterkeyed



No. 68-259
Laboratory Lock

NATIONAL LOCK COMBINATION LOCKS ARE FIRST CHOICE IN SCHOOLS EVERYWHERE

National Lock combination locks are providing superior locker security and simplified locker control in schools from coast to coast. Investigate their quality components and soundly-engineered design that spell long lock life . . . convenience in use . . . efficient charts, complete with binder, that make record keeping a breeze. Write on your letterhead for a **FREE** sample lock . . . and see the difference!



NATIONAL LOCK COMPANY
Industrial Hardware Division
Rockford, Illinois

COMBINATION SHACKLE LOCKS • BUILT-IN LOCKS • LABORATORY LOCKS

Thermo-Fax COPYING MACHINES

copy transcripts, most
school records ...
... **4 seconds FAST**

Speed and simplicity. You get both with "Thermo-Fax" Copying Machines ... because these machines are perfectly dry. Electricity alone does the copying. No chemicals to fuss with—no negatives to make. They copy directly from an original in just 4 seconds. And those copies can be on dignified white, bond-weight paper—or on any of 6 other distinctive colors. To see how this perfectly dry copying can lower paperwork costs, call your local dealer. Or mail the coupon.

*Only "Thermo-Fax" Copying Machines
do so many jobs...so quickly,
so easily, for such low cost!*



"Machines that mean business"



THE TERM "THERMO-FAX" IS A REGISTERED
TRADEMARK OF MINNESOTA MINING AND
MANUFACTURING COMPANY

Minnesota Mining and Manufacturing Company
Dept. DBV-20, St. Paul 6, Minnesota

Please show us how dry copying with "Thermo-Fax" Copying Machines can cut our paperwork costs.

Name

Address

City Zone State

MINNESOTA MINING AND MANUFACTURING COMPANY
... WHERE RESEARCH IS THE KEY TO TOMORROW

High School Principal Program Gives Quality Education Priority

PORTLAND, ORE. — Sixty-five discussion groups concerned with the problems of the nation's high school administrators will form the backbone of the 44th annual convention of the National Association of Secondary-School Principals.

The meetings will be held at the Civic Auditorium here, February 27 through March 2. Presiding at the opening session on Saturday morning will be President Cliff Robinson, director of secondary education of the Eugene, Ore., public schools. Theme of the meetings will be: Quality Education — Today's Priority.

Convention speakers include: James B. Conant, now engaged in a study of the junior high school; G. Keith Funston, president, New York Stock Exchange; Lee A. DuBridge, president, California Institute of Technology; Hubert N. Alyea, professor of chemistry, Princeton University; Frank Bennett, president, Eastern Oregon College, and Adin Hester, president, Future Farmers of America.

Guest of honor of the sessions will be Paul E. Elicker, N.A.S.S.P. executive secretary since 1940, whose resignation became effective in December. Dr. Elicker has been succeeded by Ellsworth Tompkins, former associate executive secretary.

Special convention features will include demonstrations of modern teaching devices, visits to local high schools, and dramatic and musical programs by Portland public school students.

Predicts 12 Month School Year; Machine Teaching

WORCESTER, MASS. — The nation's schools will be operated on a 12 month basis, and teaching machines will take over tedious classroom jobs, predicts Daniel R. Davies, coordinator of the Co-operative Project in Educational Administration of Columbia University.

Dr. Davies expects to see education and educators reach new heights of prestige. Teacher education of the future will be more rigorous than medical education, and educators' salaries will compare favorably with those of baseball players and movie stars, he prophesies.

Education of the future will adopt several new purposes, Dr. Davies thinks. He cites reduction of provincialism, identification and cultivation of individual talent, and development of a value system. These concepts are here today, but need 50 years to be accepted and put into great use, in his opinion.

All of these forecasts were made by Dr. Davies at the third annual seminar for school committeemen held at Clark University.

Here now! To help you...

Every Change... *Important*
Every Advantage... *Definite*



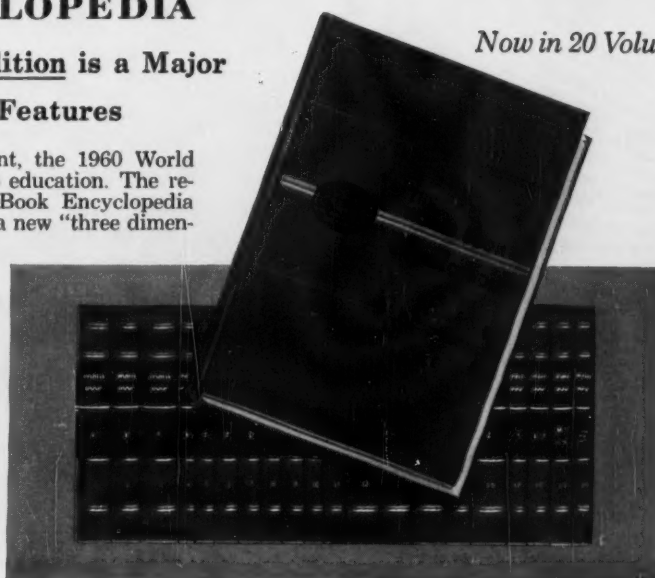
The 1960 WORLD BOOK ENCYCLOPEDIA

This Greatly Enlarged New Edition is a Major
Revision With Many Exclusive Features

Now in 20 Volumes

More than an exciting editorial achievement, the 1960 World Book makes important new contributions to education. The revised and expanded twenty-volume World Book Encyclopedia offers tested visual aids such as Transvision, a new "three dimensional" map program, and thousands of new or revised articles. New illustrations are more interesting, more numerous than ever before. In fact, no other reference set has ever been more precisely organized and systematically revised to help educators and students.

The 1960 World Book Encyclopedia represents an investment of an *additional* \$2,800,000 in creative costs to make available to schools, libraries, and homes the most modern, accurate, and useful reference set. Write for complete information without obligation. Address: World Book Encyclopedia, Box 3565, Merchandise Mart Plaza, Chicago 54, Illinois.



American Education Award Going to John W. Studebaker

WASHINGTON, D.C. — John W. Studebaker has been selected as the recipient of the American Education Award for 1960 by the board of directors of the Associated Exhibitors of the N. E. A.

In 1934, Dr. Studebaker was appointed U.S. commissioner of education, the office he held until 1948. He organized a national defense training program in engineering colleges and vocational schools and in rural areas during this time.

Prior to his appointment as commissioner, Dr. Studebaker served as superintendent for instruction in Des Moines, Iowa. He is now vice president and chairman of the editorial board of Scholastic Magazines.

He has been especially concerned with the welfare of handicapped children, adult education, education by radio, conservation education, youth guidance, crime prevention and correction through education.

N.C.A. Project Receives Carnegie Grant

CHICAGO. — The North Central Association of Colleges and Secondary Schools has been granted \$150,000 by

the Carnegie Corporation to continue its project on the guidance and motivation of superior and talented students, announced William R. Ross, N.C.A. president, here recently.

Launched in March of 1958 with a grant of \$174,000, the study was designed to identify superior and talented students in high school, to encourage them to achieve well in academically demanding courses, and to motivate them to continue their education beyond the high school.

J. Ned Bryan, formerly professor at Rutgers University, is serving as director of the project, and Bruce Shertzer, past director of the division of guidance and pupil personnel, Indiana State Department of Education, is associate director.

A.A.S.A. Meets February 13 to 17 in Atlantic City; Theme Is "Creating and Coping With Change"

ATLANTIC CITY. — Some 20,000 educators are expected at the nine general sessions and the more than 100 group sessions of the 1960 convention of the American Association of School Administrators here, February 13 through 17.

The theme of the convention will be "Creating and Coping With Change."

Lawrence G. Derthick, U.S. Commissioner of Education, will address the first

One hundred schools from among the 3500 accredited secondary schools located within the 19 states served by the N.C.A. are included in the study.

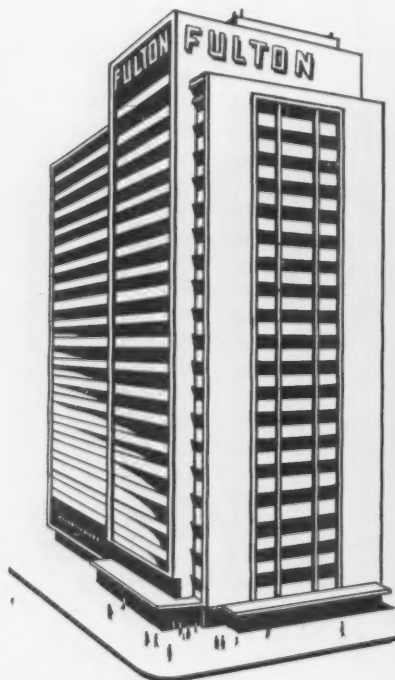
Roy M. Hall To Keynote A.A.C.T.E. Meeting

CHICAGO. — "Research and New Development in Teacher Education" will be the theme for the 12th annual meeting of the American Association of Colleges for Teacher Education to be held here February 10 through 13.

Roy M. Hall, director of the Division of Statistics and Research Services of the U.S. Office of Education, will deliver the keynote address entitled "Needed Research in Teacher Education."

general session on "Some Jobs America Has To Do." On the same program, Arthur H. Rice, editor of THE NATION'S SCHOOLS will moderate a panel discussion on "Burning Issues, Hot Potatoes, and Cool Answers." Panelists will be Richard D. Batchelder, president, N.E.A. Department of Classroom Teachers; Mrs. James C. Parker, president, National Congress of Parents and Teachers; G. E. Watson, first vice president, Council of Chief State

AT ATLANTA'S FULTON BANK...



Model PS-20BP battery powered Clarke-A-matic cleaning floor in main lobby of Fulton National Bank, Atlanta, Ga.

School Officers, and Robert E. Willis, president, National School Boards Association.

On Saturday evening at the second general session, the Golden Key Awards will be presented under the auspices of seven national education organizations comprising the Golden Key Awards Council. Following the ceremony, Harold Benjamin, emeritus professor of education, George Peabody College for Teachers and visiting lecturer in philosophy at the University of Buenos Aires, will speak.

Those at the third general session will hear Ezra Taft Benson, secretary of agriculture. Gov. Nelson A. Rockefeller of New York will address the convention on "Our Public Schools and an Expanding Economy."

Remaining general sessions have as their speakers Lee Metcalf, U.S. Congressman from Montana; Herold C. Hunt, Eliot professor of education at Harvard University, and Eric Johnston, president of the Motion Picture Association of America. The ninth general session will be sponsored by Associated Exhibitors.

The more than 100 group sessions will study some of the most pressing problems of public school education in the form of debates, research studies, symposiums, panel discussions, expositions, case studies, and interrogations of specialists.

Four films "aimed to increase the

American public's knowledge and understanding of its schools" are scheduled.

Represented in photographs, models and drawings, "outstanding" school buildings, as judged by a jury of three architects and three school administrators, will be displayed. Two auditorium floors will house 843 booths displaying teaching aids, building products, furniture, books, equipment and materials.

Martin W. Essex, president of the A.A.S.A., will preside over six of the nine general sessions. Other presiding chairmen will be Evert W. Ardis, A.A.S.A. vice president; Natt B. Burbank, A.A.S.A. executive committee member, and Ellsworth C. Dent, president, Associated Exhibitors of the N.E.A.

Commission for Professional Improvement Established

DENVER. — Colorado school administrators unanimously voted to establish a Commission for Professional Improvement at their annual joint session with school board members held here recently.

The commission is organized to bring together in a closer relationship all groups and agencies interested in improving school administration at the state level.

It was proposed at the time of inauguration that the commission concentrate its efforts on the stimulation and coordination of educational research in

Colorado, continuation of inservice improvement programs through area projects, and continuation of other programs of professional improvement.

Commission membership provides for representation from the Colorado Association of School Administrators, the Colorado State Department of Education, the Colorado Association of School Boards, and colleges and universities preparing school administrators.

The charter members are: Natt B. Burbank, superintendent, Boulder, chairman; William E. Bishop, superintendent, Englewood; John Dunlap, superintendent, Pueblo; Roy Frantz, board member, Pueblo; Calvin Grieder, professor of education, University of Colorado, Leslie Grimes, superintendent, Greeley; Kenneth Hansen, director, school of education, Western State College; Marvin Johansen, superintendent, Montrose.

Other members of the commission are Harold E. Moore, director, school of education, University of Denver; Kenneth Oberholtzer, superintendent, Denver; Gordon Quillen, professor of education, Colorado State University; Philip Rule, superintendent, La Junta; John Swenson, acting commissioner of education for Colorado; Leonard Walsh, assistant professor of education, Colorado State College; Joseph Weber, superintendent, Leadville, and Al Young, superintendent, Lamar.

ClarkeA-matic DOES A 16 HOUR JOB IN 45 MINUTES



Before placing the Clarke-A-matic self-propelled floor maintainer on the job, four men worked four hours to clean the 7214 sq. ft. of terrazzo floors in Fulton National Bank's main lobby. The floor was cleaned only once a week—a total of 16 hours labor time.

Today, the floor is cleaned in 45 minutes by one man with a Clarke-A-matic, reducing labor time 15 hours and 15 minutes each time the floor is cleaned, which, according to Fulton Bank's calculations, is a labor saving of 95 percent.

In addition, a better housekeeping job is accomplished and customers are provided with a safer, more sanitary floor. The floor is now cleaned *three times a week*. These three cleanings, requiring 45 minutes each, total only 2¼ hours—saving 13¾ hours each week.

THE BEST KNOWN NAME IN FLOOR MACHINES



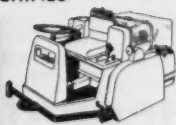
502 E. Clay Avenue, Muskegon, Mich.

Put briefly, Fulton Bank's Clarke-A-matic does three times the cleaning for less than one-seventh the former cost.

And one more thing: Clarke-A-matic gets floors clean. Instead of just moving dirt around with a mop, it scrubs, picks up and dries—all in one pass—and leaves floors sparkling. And, the Clarke-A-matic is self-propelled—ideal for cleaning large floor areas in any institutional, commercial or industrial building.

All these Clarke-A-matic advantages and savings can be yours!

Ask to have your Clarke distributor tell you how many hours and dollars you can save with the right size and type of Clarke maintenance machine. He'll gladly prove it by putting the machine through its paces on your floors.



POWER SWEEPER



RUG SHAMPOOER



WET-DRY VACUUM



FLOOR MAINTAINER



CLARKE-A-MATIC

Authorized Sales Representatives and Service Branches in Principal Cities
Distributed in Canada: G. H. Wood & Co. Limited, Box 34, Toronto 18, Ont.

Will Use \$159,000 Grant To Study Language Teaching

BOULDER, COLO. — A study to improve the teaching of French, Spanish and German in the secondary schools "by furnishing teachers with some definite notions on features of the languages they teach" will be financed by a grant of \$159,000 from the U.S.O.E.

Prof. Pierre Delattre of the University of Colorado will investigate rhythm, intonation, syllabic separation, diphthongization, tenseness or laxness of throat muscles, and lip rounding and spreading. Where research on phonetic differences has been subjective in the past, "elec-

tronics make it possible for us to study these differences objectively through manipulation of artificial speech," explains Professor Delattre.

U.S.-P.I. Team Is Surveying Philippine School System

MANILA, P.I. — A team of American educators is working with prominent Filipino schoolmen on a survey of public school education here in the Philippine Islands.

J. Chester Swanson, former superintendent of schools at Oklahoma City, is head of the education survey team.

Other American members are Edgar Morphet of the University of California; Delos Culp, president of Alabama State College at Livingston; Earle Hawkins, president of the state teachers college at Towson, Md.; Arthur Hearn, University of Oregon, and John Michaelis, University of California.

"It is particularly interesting to work in detail with the school system of another country," declares Mr. Swanson. "The Philippine public schools were organized and administered by American educators for a number of years after the Spanish-American War. It is quite unique to observe the American type of school in a centralized national school system."

The survey will be completed and a report is expected by next month.

How DUDLEY gives you the best in Combination Locker Locks



P-570

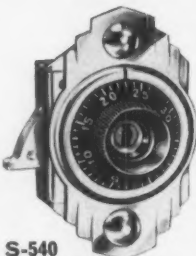
**Master-Keyed
Combination Padlock**
Finest of all master-keyed padlocks. Cast aluminum case, extra heavy steel shackle. Self-locking. Rotating dial.

Absolute Key Security

Combination locks that are opened by an ordinary master-key, offer only limited security. For it is too easy to have a duplicate made!

The Dudley Master-Key with its unique irregular channel, differing on the two sides, is almost impossible to duplicate. The machine which makes these keys is a costly piece of equipment, built largely in our own shop. No neighborhood key-maker has one or can get one — and we have never known of a locksmith making a key from the lock.

You get this master-key security *only* with Dudley Locks—the long time favorite among everyone connected with schools everywhere.



S-540

**Master-Keyed
Built-in Lock**
Fits all locker piercings. Quick combination change with special reset key.

DUDLEY LOCK CORPORATION

1436 Old Dixie Highway, Vero Beach, Fla.

The standard of controlled locker protection since 1921

Charges Educators With Ignoring Progress

NEW YORK. — "Educators are trying to solve new problems in old ways," stated Henry T. Heald, president of the Ford Foundation, at the fourth annual Teachers Congress at St. John's University here.

"Accustomed to patterns of curriculum organization and teachers assignments and training that have worked in the past, they have failed too often to take advantage of new ideas and practices that may already be in use elsewhere," he explained.

"Our schools of education still fail to attract their fair share of able high school and college graduates. This is not conducive to improved educational quality," Dr. Heald added.

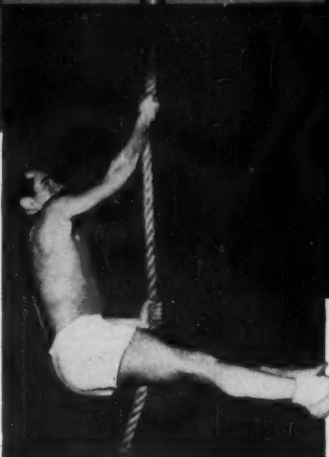
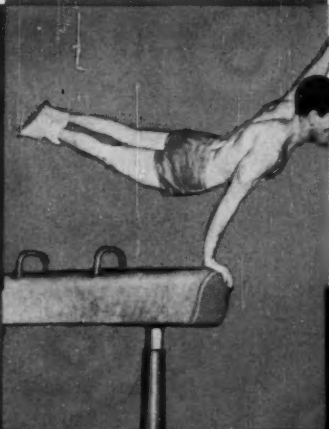
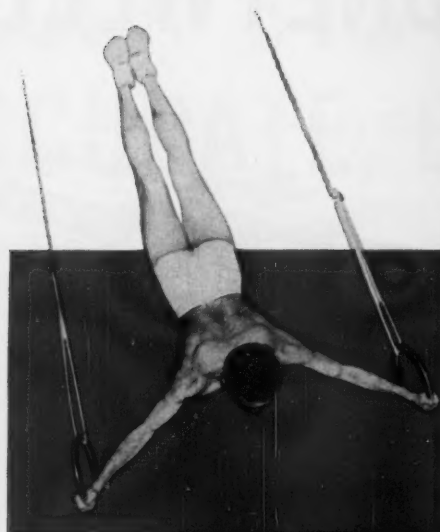
The Ford Foundation has granted nearly \$15.5 million to 19 colleges and universities during the last year to improve teacher education, Dr. Heald disclosed.

Says Children Should Know What Is Expected of Them

WASHINGTON, D.C.—Although children from 9 to 12 years old are likely to rebel against strict regulations, they are more upset if they don't know what is expected of them, concludes a report of the elementary school department of the U.S. Office of Education.

Resulting from a four-year study of the nation's school programs, the report says that children accustomed to having adults make their decisions for them are likely to demand some degree of independence, but there is no indication that rebellion is increasing.

Sponsored by the Department of Health, Education and Welfare, the study involved educators working with some 8 million children in the 4th, 5th and 6th grades.



Pace-setting design, the best of materials, precision construction, rugged durability for extra years of use . . . these are some of the reasons why Medart is the universal favorite among all gymnasium apparatus. Write for catalog.

"ENGINEERED QUALITY"
guarantees **EXTRA VALUE** in

MEDART
GYMNASIUM APPARATUS



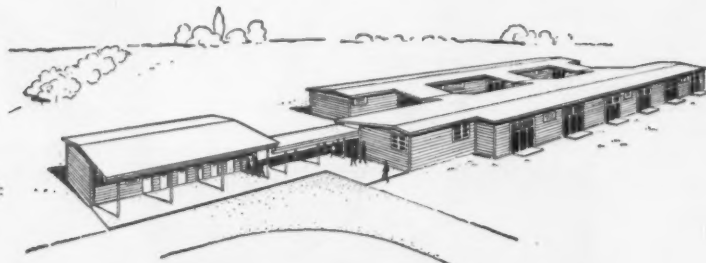
Consult the world's most experienced authority on all gym equipment problems.

FRED MEDART PRODUCTS, INC. • 3572 DEKALB STREET • ST. LOUIS 18, MISSOURI

Principal of new California school

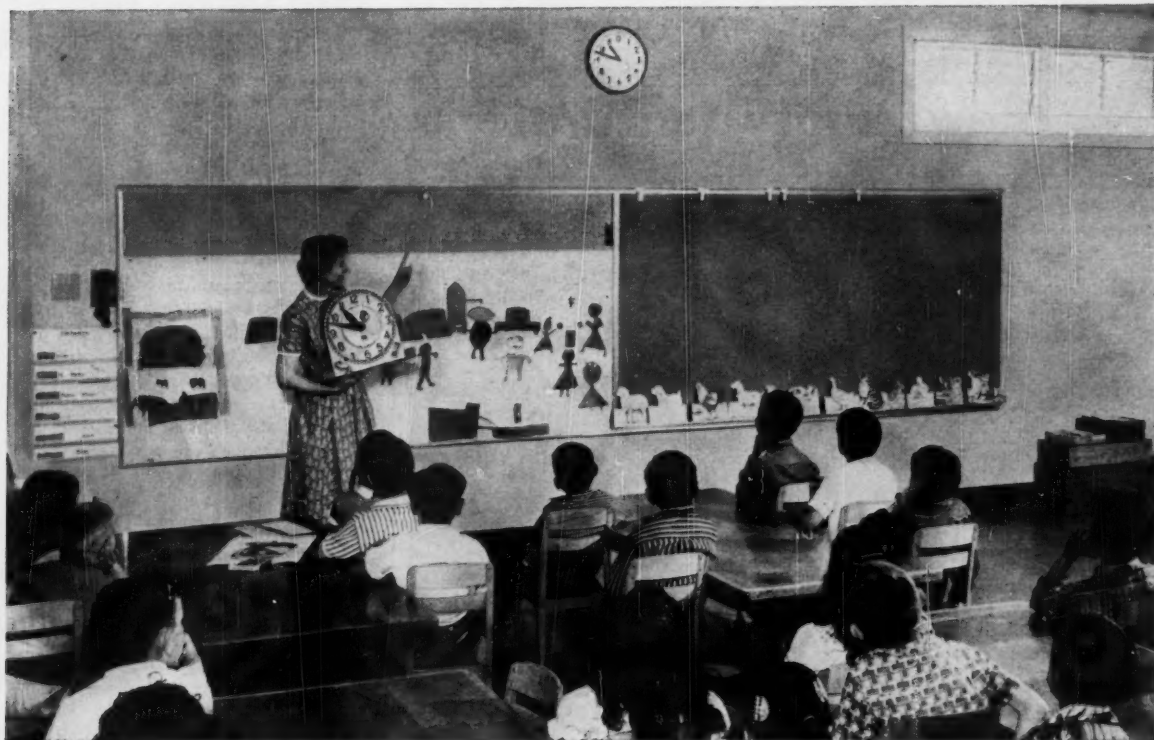
FINDS HONEYWELL'S

THE AMESTI ELEMENTARY SCHOOL,
SANTA CRUZ COUNTY, CALIFORNIA
ARCHITECT: John L. Reid & Partners
ELECTRICAL and MECHANICAL ENGINEERS:
Kasin, Guttman & Malayan
SUPERINTENDENT: Mrs. Eleanor Fontes
PRINCIPAL: Mrs. M. A. Young



Mrs. M. A. Young, Principal of Amesti School, says: "Our Honeywell Clock and Programming System eliminates the fuss and bother from program-setting. It's so simple to set and easy to change that our bell-ringing program can be completely tailored to suit school activities. With our new Honeywell Clock System, we know that every clock in the building shows the right time because the master clock checks the accuracy of each clock every hour."

CLOCK SYSTEM ACCURATE, EASY TO SET!



Honeywell's Clock System offers your school the most trouble-free programming available. Master time and master signal units are positively linked, so there's no chance for them to get out of step. Each clock is checked independently every hour to assure perfect timing. And rugged link-chain construction is an example of the quality workmanship throughout the whole system—added insurance against bothersome breakdowns.

To back up its Clock and Programming System,

and its Fire Alarm System, Honeywell offers the most dependable nationwide service available. A Honeywell expert is always on hand during planning, installation . . . and continuing through years of efficient, convenient service.

For more information about Honeywell's Clock and Programming Systems, call your nearest Honeywell office, or write: Minneapolis-Honeywell Regulator Company, Department NS-2-115, Minneapolis 8, Minnesota.

Honeywell



First in Control

School Testing Programs To Be Subject of Study

WASHINGTON, D.C. — A joint study of testing programs offered to elementary and secondary schools was announced recently by the National Association of Secondary-School Principals, the American Association of School Administrators, and the Council of Chief State School Officers.

The study will be concerned with the extent to which testing programs may influence the curriculum of the schools. It will also examine the effects of using school time for testing programs not directly connected with teaching in the school.

Charles C. Holt, assistant superintendent of Proviso Township high schools, Maywood, Ill., was named director of the project.

Emphasize Health Education as Part of Curriculum

CHICAGO. — Health and physical education must be an integrated part of the school curriculum. In this era of emphasis on science and academic excellence, health and physical education still have a vital place in the school program, according to the consensus of some 250 participants in the seventh National Con-

ference of Physicians and Schools held recently at Highland Park, Ill.

The conference, sponsored by the American Medical Association, said that if health and physical education are to be given the time they deserve in the curriculum, teachers must be properly prepared and emphasis must be placed on the development of desirable attitudes and practices as well as upon information and skills.

It recommended that attention be given to close integration of the program of health instruction with health service functions and healthful living in the school. It deplored the fact that the testing of vision and hearing, weighing and measuring, health examinations, and such matters as lighting, ventilating and sanitizing are too often dealt with "in isolation."

Calls for Equalization and Aid for Teachers' Salaries

CHICAGO. — The need for federal equalization and aid for teachers' salaries is shown by a \$3450 difference in pay of beginning teachers in cities of more than 10,000 having comparable living costs. This was stated by Carl J. Megel, president of the American Federation of Teachers, at the annual midyear meeting of the federation's executive council held here recently.

Mr. Megel quoted a national survey of teachers' salaries just completed by George Reuter, the federation's research director, as showing "only small average and spotty improvement" in teachers' salaries this year over last.

Sophie Jaffe, a vice president of the A.F.T. and 6th grade teacher, told an afternoon session of the council that the responsibility for the "teaching of initiative, responsibility and adaptability" is being shifted by the home to the teacher.

Seven States Win Awards for Driver Training Work

NEW YORK. — Seven states recently received achievement awards for their driver training programs in the 1958-59 school year, from the Association of Casualty and Surety Companies. They are: Delaware, Iowa, Kansas, Massachusetts, Michigan, North Carolina and Utah.

Delaware, North Carolina and Utah also received awards for a "marked advance" in their driver training programs. New Jersey and the District of Columbia received progress awards as well.

The insurance report indicated that 63 per cent of the 21,000 public high schools in the nation offered some kind of driver training to the 67.7 per cent of students who were eligible. A total of 1,338,246 public high school students received driver training at school last year.

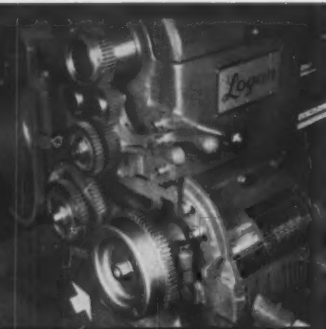
new safety feature!

Logan

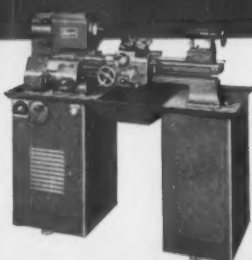
Automatic Safety Gear
new standard equipment
on 10" and 11" models

All Logan 11", 12" and 14" lathes, as well as models 1825 and 1875 (shown) 10" lathes, now offer positive overload protection without additional cost. Exclusive Automatic Safety Gear absorbs shock of sudden overloads when threading, preventing gear damage from spindle to gear box. Also protects all gears in gear box up to 52 threads per inch. The combination of this Safety Gear and spring-loaded lever-operated clutch in apron gives the same protection for corresponding feeds. Can be factory-installed on other models of new 10" and 9" quick-change lathes. Available for present Logan quick-change lathes: \$10 for 9", 10" and 11" sizes, \$15 for 12" and 14".

For full model details and evidence of Logan's low upkeep and better service, see your Logan dealer, or write for catalog.



12" Lathe



10" Lathe



LOGAN ENGINEERING CO., Dept. F-260, 4901 Lawrence Ave., Chicago 30, Ill.

PORTION CONTROL...

its economies are directly related to your selection of the *right* utensils.

No other manufacturer in the institutional cooking utensil field can match the wide range of sizes, styles, shapes and finishes available to you in . . .

Wear-Ever Aluminum.

Be sure to insist on this famous trademark of quality on the utensils you buy.



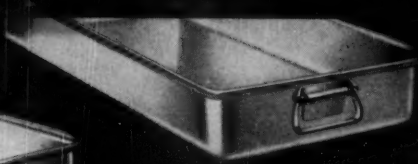
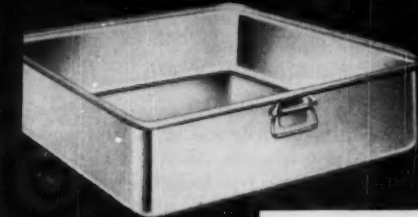
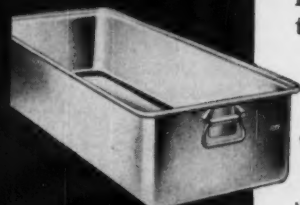
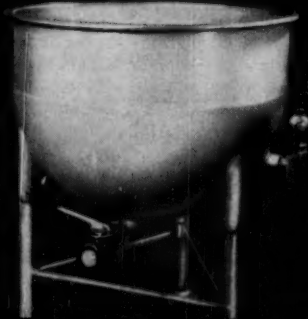
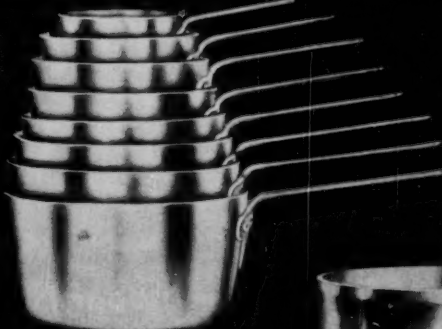
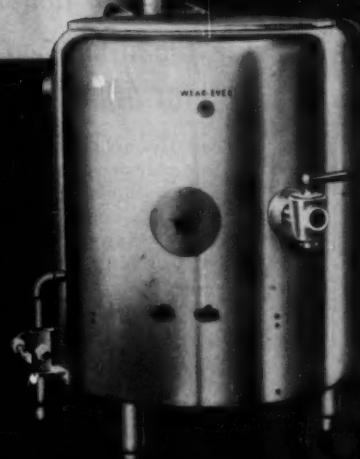
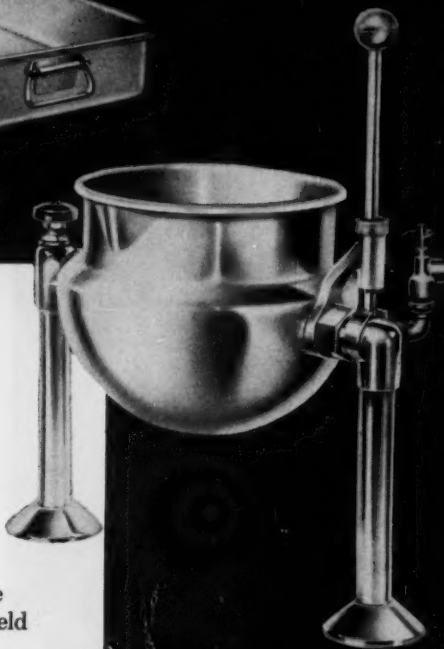
WEAR-EVER

WEAR-EVER ALUMINUM, INC.

WEAR-EVER BUILDING, NEW KENSINGTON, PA.



New Catalog! Shows capacities, no. of servings (in ozs.) for most commonly used utensils. Free! Send for your copy today.



HOBART'S NEW 30-QT. MIXER

CUSTOMER-
DESIGNED
with
CONVENIENCE
CONTROLS



ONLY HOBART
OFFERS ALL
THESE FEATURES:

- ★ *Positive drive*
- ★ *Positive speeds*
- ★ *Positive Hobart planetary action*
- ★ *Clean-lined...completely sealed
for utmost sanitation*

From Hobart motor to bowl, this all-new mixer has been compactly designed to give you more efficient, easier operation. Exclusive ventilation system (no louvers or vent openings) keeps the ½ h.p. Hobart built motor cool while locking out dirt and ingredient dust. Feather-touch, spring-counterbalanced bowl lift, locks firmly and automatically in operating position.

Optional equipment available are complete 20-quart equipment, timed mixing control, thermal overload and low-voltage protection, and magnetic-type starter. There's a full line of attachments for the standard No. 12 attachment hub...plus a tray support for added food preparation convenience, and a bowl truck (both optional). The Hobart Manufacturing Company, Dept. 307, Troy, Ohio.

The Most Complete Line with Nationwide Sales and Service

Hobart MACHINES



World's Oldest and Largest Manufacturer of Computing Scales and Food Store, Bakery, Kitchen and Dishwashing Machines.

BETTER BUY MIXERS...

BETTER BUILT BY HOBART

Survey Seeks Key Design for Physics Buildings

NEW YORK. — A special section on high school physics facilities will be incorporated in a report to be published this summer on the Project on Design of Physics Buildings.

According to R. Ronald Palmer, director, the study is made possible by a grant from the Educational Facilities Laboratories, Inc., and is co-sponsored by the American Association of Physics Teachers and the American Institute of Physics.

Dr. Palmer, a physicist on leave from Beloit College, says that while the design study was initiated to provide needed information to those planning to spend an estimated \$250 million on new college and university physics buildings within the next few years, the findings should have implications for the teaching of physics at the secondary level. William M. Rice, on leave from the Lawrence Radiation Laboratory of the University of California, is project architect.

Information on physics facilities currently is being gathered at selected high schools, universities and colleges throughout the country by questionnaires and firsthand visits. Both good and bad features are being explored in existing classrooms, lecture halls, teaching laboratories, research laboratories, and supporting spaces, including room layout and electrical and mechanical services.

Top Scientists To Meet With Science Teachers

KANSAS CITY, MO. — Some of the nation's top practicing scientists will work with approximately 2000 teachers at the eighth annual convention of the National Science Teachers Association to be held here March 29 to April 2.

The role and importance of a broad and continuous science program for all American school children from kindergarten through the 12th grade will be studied.

Dr. Linus C. Pauling, who won the 1954 Nobel Prize in chemistry, and Dr. Walter H. Brattain, a co-winner of the 1956 Nobel Prize in physics, will head the roster of distinguished speakers.

To Hold National Conference on Higher Education

CHICAGO. — "Platform for Higher Education; Guide Lines for the Sixties" is the theme for the 15th National Conference on Higher Education to be held here March 6 through 9.

Topics to be taken up at discussion group meetings include developments in federal legislation, in segregation and desegregation, and in educational TV.

Schools' Responsibility for Delinquents Defined

WASHINGTON, D.C. — Schools' responsibility for the delinquent does not differ essentially from their responsibility to all other children or to other "special children — the blind, the deaf, the crippled, the mentally retarded, or even the gifted, asserts a report of the N.E.A.'s Juvenile Delinquency Project.

The report, "Delinquent Behavior: Principles and Practices," enumerates eight general principles that should guide schools in efforts to prevent and control juvenile delinquency. Working from these general principles, the authors have set up, under each category, an amplifying statement of how these principles can be put into practice. Each such section of the 350 page book is followed by a report on what is actually being done along these lines in many specific school districts in the country.

Juvenile delinquents are essentially "normal" youngsters, reacting normally to their own environment, according to study findings.

Would Permit Use of Force in Keeping Discipline

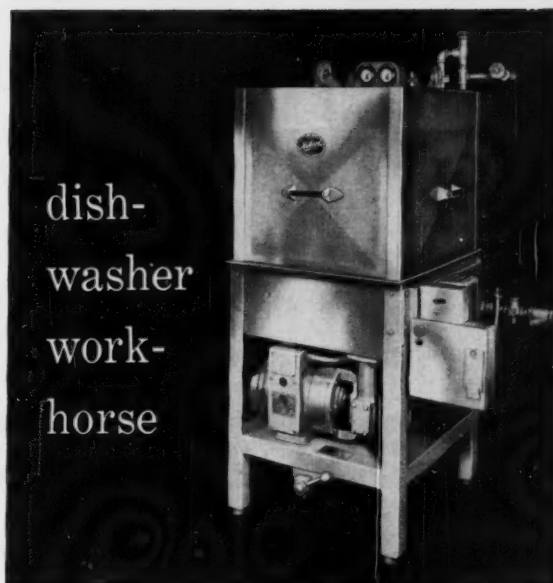
BLOOMINGTON, IND. — School discipline is not strict enough, agree 60 per cent of Phi Delta Kappans in a recent random sampling of the professional education fraternity's 32,000 members in 200 chapters. Thirty-eight per cent are satisfied that discipline is firm as it is.

There is more unanimity on the question of permitting teachers to use force in keeping discipline. Seventy per cent of the Phi Delta Kappans who replied favor legislation that would permit teachers to use force, in those states where legal restrictions exist.

"A teacher may resort to force only in extreme cases, and when the teacher and principal are in agreement that other means have failed," agree 29 per cent. Another 29 per cent think that a teacher should be authorized to "use reasonable physical force in moderate degree to keep discipline." Eleven per cent favor this statement: "A teacher may have full authority to 'paddle the problem child' or use other physical means to maintain discipline."

Scholarships Established by Federal Government

WASHINGTON, D.C. — The federal government has established 150 scholarships to train teachers of mentally retarded children. Going to 50 state agencies and 14 universities, the scholarships are a part of a \$1 million appropriation approved by Congress last year.



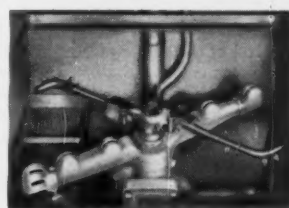
...in just two feet

Crowded kitchen? A model from the Hobart AM Series makes any straight-through or corner installation a high-capacity dishwashing center—with just two feet of machine space between tables.

Hobart's exclusive power wash and above-and-below rinse give you today's finest wash-rinse system for quality results at lowest labor costs.

Electric timed control or semi-automatic models available...they reduce operator supervision...and assure maximum washing and rinsing efficiency. The Hobart Manufacturing Co., Dept. 307, Troy, Ohio.

Hobart Revolving Wash and Rinse Principle. All AM Series dishwashers incorporate this feature that assures thorough coverage of the entire rack area. Door interlocking device prevents opening doors during wash and rinse.



The Most Complete Line with Nationwide Sales and Service



See HOBART at the American School Food Service Association Show, Brooks Hall Civic Auditorium, San Francisco at Booths 335, 337 and 339.

Hobart MACHINES

The World's Oldest and Largest Manufacturer of Food, Bakery, Kitchen and Dishwashing Machines

BETTER BUY DISHWASHERS...

BETTER BUILT BY HOBART

Predicts More Federal Aid for Parochial Schools

CLEVELAND. — Governmental support for private and parochial schools, in one form or another, will increase in the future, predicted Gerald H. Read, professor of education, Kent State University, Ohio. He was speaking at the fifth annual meeting of the National Organization on Legal Problems in Education held here recently.

Dr. Read said that some parochial schools are already receiving federal funds for certain purposes and predicted that, as this continues, more religious

groups are likely to form their own parochial schools in order that they may take advantage of such funds.

At another session, M. M. Chambers, visiting professor of higher education at the University of Michigan, told N.O.L.-P.E. members that the idea that federal support for education will bring federal control is a myth.

There is nothing to prevent us from obtaining support for education from the federal government while leaving control in the hands of legally constituted agencies, he added.

He urged more state support for higher education and called for free tuition in

state universities. Opposing long-term governmental loans to students, Dr. Chambers suggested a system of scholarships that would aid private as well as public institutions of higher education in the United States.

Two-Year High Schools Started in Israel

TEL AVIV. — Twenty-six two-year secondary schools for some 1000 elementary school graduates are being opened this year in Israel. This is an entirely new venture for Israel. The schools are situated chiefly in development areas, and are for children who are unable or do not wish to continue with the full four-year secondary school program. The weekly curriculum includes 30 hours of general subjects and from 12 to 15 hours of vocational training.

Tuition is free or ranges up to \$140 a year according to the family's means. Most students attending the high schools pay about \$28 in annual tuition.

Would Employ Logic To Teach Arithmetic

ANN ARBOR, MICH. — Elementary schools could use modern developments in mathematics and logic to simplify the learning of arithmetic, Henry Van Engen, professor of mathematics and education at the University of Wisconsin, told elementary teachers at a meeting here recently.

Mr. Van Engen said: "Present-day arithmetic courses show little evidence of the work done in the last 50 years to organize the foundations of mathematics. Elementary schools must organize arithmetic for the child by using fundamental principles of mathematics."

"One of the most pressing needs in the elementary school is a mathematical, psychologically sound approach to problem solving," he said. "Most present-day arithmetic programs have no way to teach a child how to solve problems except to depend on misleading clues," he declared.

Conversational Spanish for North Iowa Sixth Graders

CARNER, IOWA. — A beginning course in conversational Spanish is being presented to approximately 3000 sixth grade students in seven northern Iowa counties.

Financed and administered by the county boards of education, the course is telecast daily by a commercial station for 30 minutes, five days a week for 38 consecutive weeks. It is presented in a predominantly rural area with schools of moderate or small enrollments.

AIR FORCE ACADEMY USES SANI-STACK RACKS



WHERE QUALITY COUNTS MOST

Yes, where quality and efficiency count most, the Sani-Stack system is used at the U.S. Air Force Academy.

The dining hall of our great new Air Force Academy seats and serves the entire cadet body at one seating. This calls for unparalleled efficiency. And the Sani-Stack system really delivers!

China and glassware are handled only twice. Between servings they are safely, sanitarily stacked and stored in a fraction of the space normally used.

Sani-Stack serves the finest commercial, institutional and military establishments everywhere. See how Sani-Stack can save time, labor and breakage, working for you! Get the details from your dealer today — or write to us direct!



Genuine Sani-Stack racks are made only by Metropolitan Wire Goods Corporation



Sani-Stack A QUALITY PRODUCT OF
METROPOLITAN WIRE GOODS CORP.
N. WASHINGTON ST. AND GEORGE AVE. WILKES-BARRE, PA.

United Manufacturers

UNITED TO MAKE WORLD'S FINEST FOOD SERVICE MACHINES



Four Manufacturers with One Standard — High Quality — United to Bring You A Full Line of Food Service Machines with All the Advanced Features for Cost-Saving Operation.

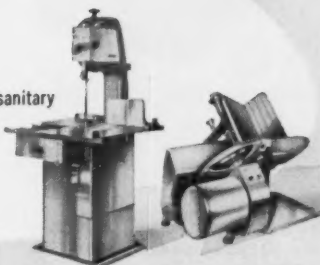
Buy United — for the advantages of single source buying, shipping and servicing — with complete warehouse and service facilities from coast to coast.

UNIVERSAL DISHWASHERS

A "right" sized machine for every fast dish, glass and silver washing system. A complete line of dishwashing machines and equipment; 3 Immersion type; 5 Roll Top type; 13 Single Tank Door and Curtain type; 9 automatic Rack Conveyor type single to four tank; 25 Rackless type with nylon continuous belt; 12 new Circular Conveyor type.

SANITARY SLICERS, CHOPPERS AND SAWS

Sparkling new high-brite aluminum finish, built-in controls and long life sanitary construction for beauty, performance, capacity and easy maintenance.



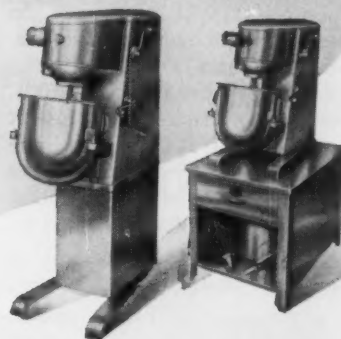
TRIUMPH MIXERS

Vertical mixers with planetary action in all sizes from 12 to 110 quarts, bench and floor models. Mixmobile in 12 and 20 quart sizes. Power take-off for all attachments. Positive action, power-operated bowl positioning available on 30 quart to 110 quart mixers. Beaters matched to bowls for "down to the bottom" mixing.



MJM PEELERS

A complete line of heavy duty peelers in 15, 20, 30 and 50 lb. capacities for faster peeling and less peel loss. High or low stand, bench or mobile mounting. All aluminum construction; exclusive self-sharpening abrasive on bottom and walls.

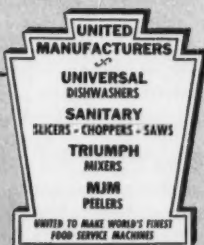


NOW —

Buy United and get all your food service machines from one dependable source. Contact your United Manufacturers dealer or write:

UNITED MANUFACTURERS

42 Windsor Place, Nutley, New Jersey • Telephone North 7-2790



UNIVERSAL DISHWASHING MACHINERY CO.

50 Windsor Place, Nutley 10, New Jersey
Tel. North 7-2790

SANITARY SCALE COMPANY

Belvidere, Illinois
Tel. Lincoln 4-2181

THE TRIUMPH MANUFACTURING CO.

3400 Spring Grove Ave., Cincinnati 25, Ohio
Tel. Kirby 1-3740

MJM MANUFACTURING CO.

8479 Steller Drive, Culver City, California
Tel. Upton 0-4191

Floor Maintenance Automation



8 $\frac{1}{4}$ Man Hours In One!

The new Advance "Convertamatic" scrubs and vacuums 12,500 square feet of floor an hour—over eight times the area one man can clean with 19" floor machine and vac!

Here's a one-man floor cleaning gang that operates at a finger's touch. In one pass, it lays solution, scrubs, vacuums and dries. Or, also in one pass, it dry-polishes and vacuums. Goes forward or back—from slowest walk to a near trot. It turns on a dime . . . operates on pennies . . . and saves dollars and dollars of costly labor. Call or write for full details today!

- Gasoline, propane, electric and battery models available.
- Fully variable speeds, forward or reverse.
- Brush pressures can be varied from 0-160 lbs.
- Double-bladed suction squeegee dries floors 50% faster.
- Exclusive "Powerflo" drive—no clutch, no differential.
- Twin brushes cut big 24" swath.
- 12 gal. solution tank.
- Choice of 12 or 16 gal. recovery tank.
- Lease and Finance Plans available.



Why walk when you can ride? Optional sulky attachment takes the fatigue out of floor care . . . increases efficiency and output.

ADVANCE FLOOR MACHINE CO.
109 Industrial Center
Spring Park, Minnesota
Telephone GReenwood 1-8481

ADVANCE

ADVANCE FLOOR MACHINE CO.
109 Industrial Center
Spring Park, Minnesota

Yes, I'd like full details on the Convertamatic. I understand there is no obligation.

Name.....
Address.....
City.....State.....

Poor Country Cousins. A statistical survey released by the N.E.A. reveals that the city teacher in the U.S. averages \$5313 a year, about 25 per cent more than his country cousin, who manages on \$4013 yearly. A quarter-century ago the country school marm took home only 45 per cent of the city teacher's salary. Ten years ago the difference was 29 per cent. N.E.A. figures show that in terms of purchasing power, using 1958-59 dollars, the increase was 46 per cent for teachers and 80 per cent for all wage and salary workers. However, the average income of all other workers is still well behind that of teachers in actual dollars.

Captive Audience. A Long Island former high school history teacher who is serving a six-month sentence on a misdemeanor narcotics charge — he began taking the dope during a "painful illness" — is teaching a group of youngsters in a pilot educational program at the Nassau County jail. Harry E. Hanners, 40, who taught at Levittown, volunteered to start the school after learning that jail officials were considering an educational program for youths from 16 to 20, but had no budgetary allowance for a teacher. Hanners instructs 20 inmates five hours a day in mathematics, American and world history, English and basic economics for the 7th through 12th grades.

Principles for Planning

(Continued From Page 106)

measuring instruments, heat and water source, sinks, electrical fixtures, spectroscopes, centrifuge, oscilloscope, generator, radioactivity equipment, greenhouse, human torso model, facilities for individual work groups, and visual aid equipment.

ELEMENTARY SCIENCE: geiger counter, charts for physical science, weather equipment, and motors.

GENERAL SCIENCE: demonstration equipment, microscopes, audio-visual aids, glass tubing and beakers, specimens, barometers, ammeters and voltmeters, electronic equipment, vacuum pumps, charts and maps, precision scales, natural gas, electricity and water facilities for individual groups, static machines, stethoscope, stroboscope, and ripple tanks.

PHYSICS: static machine, light equipment, mechanics equipment, electronic equipment, microscopes, trolley apparatus, oil drop apparatus, micro-wave apparatus, generator, dissection materials, chemical hoods, audio-visual equipment, ripple tank, inertia wheels, air compressors, diffusion pump, DC generators, and telescope.

Included in the original lists were also these non-equipment items: more modern text and reference books, library materials in classrooms, charts, chemicals, and microscope slides.

You can do more with

DELTA



Put 31 years of extra "know how" to work in your school shop

When you call your Delta Distributor you get the full benefit of Delta's 31 years experience in serving the school shop field. Equipped with this "know how," your Delta Distributor can give you assistance with any phase of your industrial arts and vocational education program—layouts for new or expanding school shops, guides for specifying tools, instruction manuals and new project ideas, plus

a complete library of *practical* shop teaching aids.

In addition to providing you with unequalled service and cooperation, your Delta Distributor is a single source for the finest, safest tools your students can use—the same rugged, economical tools used throughout industry. To call for extra "know how," just look under "TOOLS" in the Yellow Pages for the name of your nearest Delta Distributor.



See 61 Delta machines, 302 models, over 1400 accessories—pictured and described in the Delta Industrial Catalog. Write for FREE copy to: Rockwell Manufacturing Co., Delta Power Tool Division, 406B N. Lexington Ave., Pittsburgh 8, Pa.

DELTA INDUSTRIAL TOOLS

another fine product by

ROCKWELL





Background for better schooling:

the familiarity

What is the primary function of a school building? To contribute to, not merely shelter, the process of educating young minds.

For this reason, for school buildings, wood is the most *functional* material available today. Wood's familiarity . . . its characteristic air of friendliness . . . uniquely aids learning and teaching alike. Warm surroundings of natural wood help make school children more responsive, school teachers more relaxed, the *environment for learning* more in keeping with the true goals of education.

Wood is structurally functional, too, as exemplified here in Maine's Bar Harbor Elementary School . . . Alonzo J. Harriman, Inc., architects. Strikingly beautiful inside and out, it dramatizes the flexibility, durability, and economy of wood construction.

The more *wood* you use in a school, the more *good* school you build for each tax dollar.

NATIONAL LUMBER MANUFACTURERS ASSOCIATION

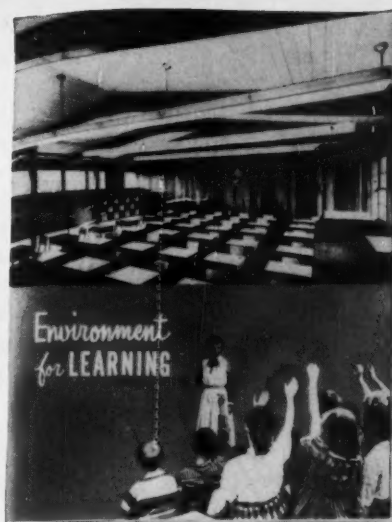
Wood Information Center,
1319 18th St., N.W., Washington 6, D.C.



of WOOD

This informative new booklet, "Environment for Learning," contains comprehensive data on the use of wood in schools. For your free copy (or copies), write to NLMA at the address shown.

Live, Work, Build Better with **wood**



A.A.A.S. Convention Told Danger of Machines; Need for Use of Scientists in State Department

CHICAGO.—“Scientists should sit with other scholars from all areas of intellectual activity to consider problems relating to education and the support of research in general,” H. Burr Steinbach, head of the University of Chicago’s zoology department, told a general session of the American Association for the Advancement of Science here recently.

Dr. Steinbach also believes that “scientists should contribute their powers of orderly thought, comprehension and judgment to top policy considerations—

federal government and otherwise.

“There is no sense at all in neglecting a universal language, such as that of science, as a potent tool in aiding the formation of policy, especially on the international scene,” he said.

The 126th convention of the association contained sectional meetings on mathematics, physics, chemistry, astronomy, geology and geography, zoological sciences, botanical sciences, anthropology, psychology, social and economic sciences, history and philosophy of science,

engineering, medical sciences, dentistry, pharmacy, agriculture, industrial science, education, and science in general. The various societies of each section also met.

“Moving Frontiers of Science” was the topic of the fourth general symposium, which consisted of “reports of research trends and findings of such broadly ramifying nature that they are of concern to many branches of science.”

Thinking machines may outthink their creators, warned Norbert Wiener, a mathematician of Massachusetts Institute of Technology, at a general session of the association.

The assumption that machines cannot possess any degree of originality is false, Dr. Wiener contended. “This belief frequently takes the form of statement that nothing can come out of the machine that has not been put into it.

“One property of machines which is now actively admitted, it that over a limited range of operation they act far more rapidly than human beings and are far more precise in performing their operations. By the very slowness of our human activities, our effective control of machines may be nullified,” Dr. Wiener added.

Integrate Science Program

One hundred and fifty members present at the National Science Teachers Association meeting, which took place simultaneously with the A.A.A.S. convention, unanimously agreed that there should be an integrated science program from kindergarten through Grade 12. Eighty per cent believe that the N.S.T.A. should furnish guide lines and suggested framework upon which to build a curriculum.

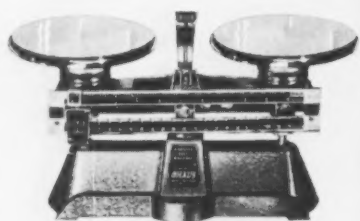
Out of a discussion came the resolution that the K-12 science sequence should contain a multiple track science program, that is, provisions for the advancement of students in order to enable them to work at their own pace.

It was the consensus of N.S.T.A. members attending the meeting that the day of teachers working independently in building a science curriculum is over. From now on teachers will seek advice and counsel of scientists, curriculum experts, and others working in the field of science education.

Who Writes Whose Ticket?

Allowing youngsters to select their own schedule of studies and thereby write their own educational ticket, often following the line of least resistance, has been deplored by John B. Fischer, dean of Teachers College, Columbia University. Speaking at the 14th annual conference of the New Jersey School Superintendents Association, Dr. Fischer also said it would be a good idea to spend more time teaching English.

**your
SCIENCE
DEPARTMENT
deserves
THE BEST...**



**HARVARD TRIP BALANCE
Model No. 550-S**



**LOW INITIAL COST
Models from \$20.50**

**LONG LIFE-LASTING
CORROSION
PROTECTION**

**SELF ALIGNING
AGATE BEARINGS**

**HARDENED STEEL
KNIFE EDGES**

**HIGH STRENGTH CAST
ALUMINUM BEAM WITH
ENDS CROSS-BRACED**

CAPACITY—2 KG.

SENSITIVITY—0.1 GRAM

for complete
information **WRITE**
for **FREE** bulletin!

OHAUS

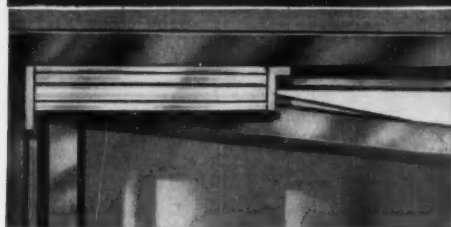
SCALE CORPORATION
1050 COMMERCE AVE.
UNION, NEW JERSEY

NEW-TYPE NORTON DOOR CLOSERS AN ARCHITECTURAL ASSET IN THIS MODERN MICHIGAN SCHOOL!

A continuing series of outstanding schools, office buildings, hospitals, churches, and industrial structures using NORTON DOOR CLOSERS



HIGH SCHOOL: MICHIGAN CENTER, MICH. WARREN HOLMES COMPANY ARCHITECTS
HARDWARE DISTRIBUTOR: SCHABERG DIETRICH HARDWARE CO., LANSING, MICH.



NORTON 750: A powerful corner-type closer of unique design that blends inconspicuously with top rail of modern metal-framed doors. Full rack-and-pinion mechanism handles doors up to 42" x 84".

Employs unique corner-type Norton Door Closers to complement clean-lined modern door design.

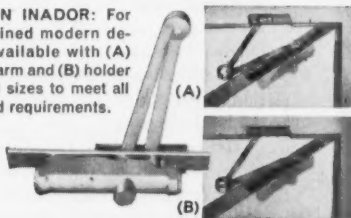
Thoroughly modern in appearance, this school is equally modern in every item of functional equipment, including Norton Door Closers. Of particular interest among the latter are the Model 750 corner-type Norton Door Closers used on principal entrance doors.

Model 750 was specifically designed to blend unobtrusively with the narrow rails and stiles so popular in present-day doors. The shell is extruded from a very strong, durable, 100%-seep-proof aluminum alloy. Arms are completely concealed when the door is closed. Full rack-and-pinion mechanism offers the ruggedness, dependability and precision workmanship common to all Norton Door Closers.

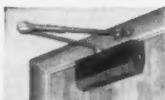
Other Norton models are available to satisfy every door-closer need. Write today for full information about all models, including the new Trimline series.

Complete Norton Line Meets Every Door Closer Need

NORTON INADOR: For streamlined modern design; available with (A) regular arm and (B) holder arm... 4 sizes to meet all standard requirements.



NORTON SURFACE-TYPE: For all installations where concealment is not essential.



NORTON 703-N Compact surface-mounted type... 1 1/4 inch projection.

NORTON® DOOR CLOSERS

Dept. NS-20, Berrien Springs, Michigan

BRADLEY WASHFOUNTAINS... at Clarence A. Struble Elementary School



FOR THE UPPER GRADES—Standard Height Washfountains (36-in. Diameter) are located convenient to "Girls" rest room door at one end and "Boys" at the other.



Architects and Engineers—
Sullivan, Isaacs and Sullivan,
Cincinnati, Ohio
COLERAIN TOWNSHIP
Hamilton County, Ohio

FOR THE LOWER GRADES—Junior Height Washfountains are four inches lower.

IN ELEMENTARY SCHOOLS, TOO

ULTRA-SANITARY, AND ECONOMICAL WASHING FACILITIES

With foot control, hands are thoroughly washed and thoroughly rinsed without faucet contacts. Conveniently placed Washfountains encourage cleanliness. They are economical, because one set of piping connections suffices for each 4 to 6 person (36-in.) Washfountain.

In schools, colleges, institutions throughout the land—thousands of hands are washed daily in this sanitary manner. Besides the 36-in. models there are the larger 54-in. sizes both full circular and semi-circular (wall mounted). And the smaller Type Duo used in First-Aid Rooms, Faculty Rest Rooms, near entrance from playgrounds, in cafeterias, etc.

For the complete story and specifications write today for new Catalog 6004. No obligation. BRADLEY WASHFOUNTAIN CO. 2207 W. Michigan Street, Milwaukee 1, Wisconsin.



BRADLEY
washfountains



Write for
new Cat. 6004

Death Takes Integration Leader, Omer Carmichael of Kentucky

LOUISVILLE, KY. — Omer Carmichael, 66, superintendent of schools here since 1945, died January 9, apparently from a heart attack. Dr. Carmichael was nationally known for the successful integration program in the Louisville school system. He had held various offices in the A.A.S.A. and had been president of the state education association in Alabama, where he had been superintendent at Talladega and Selma. He also had been superintendent at Tampa, Fla., and Lynchburg, Va.

Calls for Lab Facilities With General Science Course

CHICAGO.—General science, a textbook and lecture course in most junior high schools, needs laboratory facilities as much as any other science course, Basil Castaldi, University of Illinois school building specialist, told the National Association of Biology Teachers here recently.

Professor Castaldi called for a self-contained science room combining classroom and laboratory in which pupils may be put to work on problems related to principles they have just been taught during the class period.

"Reinforcement of learning through prompt application of textbook or lecture material is the best teaching for all pupils, whether they be bright, slow or average," Professor Castaldi said. "Laboratory periods twice a week in some other room do not provide this experience at the right time," he added.

Say 'Why Science Must Be Taught With Science'

NEW YORK. — The reason science is important in the world today, as well as the subject matter of science, must be taught American high school students, urges a recent report by the Science Manpower Project of Teachers College, Columbia University.

The report resulted from a study of the attitudes of a statewide cross-section of 3300 New Jersey high school seniors toward science and scientific careers.

As a group, the students were favorably disposed toward science, but "substantial numbers" of nonscience students in the high ability group indicated that they did not fully understand the nature of science and scientific work.

The science teacher is in a key position to help young people gain a constructive understanding of scientific endeavor, declared Hugh Allen Jr., associate professor of physics and science education at Montclair State College, New Jersey, who made the study.

LEVOLOR VENETIAN BLINDS WERE ESPECIALLY DEVELOPED FOR SCHOOLS TO WITHSTAND CONSTANT USE

The sturdiest of all venetian blinds are LEVOLOR Heavy Duty, (Orange Line) designed specifically for school use.

The head channel is .025" thick—a safety factor for extra wide, extra heavy blinds.

Virgin aluminum slats are pressure plastic coated to give a hard, smooth finish. The photomicrographs below are magnified one hundred times. Compare the finishes. These are just a few of the features that make Levolor Heavy Duty Venetian Blinds first choice in schools everywhere.



The paint finish on a Levolor Brand Aluminum Slat.

Paint finishes on competitive brands.

LEVOLOR VENETIAN BLINDS
CUSTOM MADE BY FRANCHISED MANUFACTURERS

Write for the "Levolor Architect's Manual for Venetian Blinds." The fourth edition of this invaluable illustrated book is now available on request. No obligation. Write to Levolor Lorentzen, Inc., 724 Monroe St., Hoboken, N. J.



COPYRIGHT 1965

'Negro Youth Need Training To Compete for Employment'

WASHINGTON, D.C. — "Added efforts must be made to help Negro parents to keep their children in school so that they can compete for employment more effectively," said a report of the Committee on Government Contracts, with Vice President Richard Nixon as chairman.

The report continued: "But theirs is not the only responsibility. In the interests of the national economy as well as Negro workers, it is up to our educators, vocational guidance counselors, and employers to see that the Negro youth has the opportunity for the kind of training

that will prepare him for the types of jobs which we know will call for numerous workers the next 10 years."

Recent Census Bureau data indicate that 80 per cent of white children between the ages 14 and 18 are attending high school, while only 65 per cent of Negro children in the same age group are enrolled, the report asserts.

According to Labor Department projections, the report states, 7.5 million new workers during the next decade will be without a high school education. Unless the situation of the past and present is sharply changed, the committee believes that a very high proportion of these "handicapped" workers will be Negroes.

'Child's Mental Health Is Teachers' Responsibility'

ANN ARBOR, MICH. — Parents in our society have made teachers responsible for the mental health of their children, declares Elton B. McNeil, associate professor of psychology at the University of Michigan.

"It isn't enough today for a teacher to be an educated quiz-master. In this psychological age, citizens of our society can no longer accept teachers whose educational function is merely to pass on facts, figures and information to children," Professor McNeil says.

The current "low ebb in teacher morale" stems from the fact that the training teachers get in schools of education and on the job is not adequate to prepare them to manage such complicated and difficult responsibility, according to the psychologist.

He believes that "we must train the average classroom teacher to understand and apply the orientation and skills of clinical psychology to the classroom learning situation."

The psychological approach to education is a movement to return in spirit to the education of the whole child, he maintains. "The future will see the impact of teachers on the social, emotional and intellectual development of our children increased immensely," Professor McNeil forecasts.

School Districts Liable; Decision Not Retroactive

SPRINGFIELD, ILL. — Following a rehearing by the Illinois supreme court of the *Molitor v. Kaneland Community Unit District No. 302* case (The Nation's Schools, August 1959), the court rendered a decision similar to the one it had given earlier: School districts are not immune from tort liability. The court stated, however, that the precedent established in this case will not be applied retroactively but will apply only to accidents following date of the decision.

Favors More Intellectual, Less Vocational, Training

PHILADELPHIA. — American education must become less vocational and more intellectual, declared Henry S. Commager, historian from Amherst College, speaking to a group of teachers and school administrators at the University of Pennsylvania.

He suggested that schools abolish paid coaching staffs, band uniforms and expensive stadiums, and drop courses in driving.

Favoring a longer school day and week, Dr. Commager maintained that, with more concentrated work, the brightest high school students could be graduated in three years instead of four.

ELEMENTARY Science Demonstrations IN ANY ROOM! ON ANY BUDGET!

Grade-Aid Corporation's new ALL-STEEL JUNIOR MODEL PORTABLE SCIENCE TABLE MODEL B501

Priced within reach of the smallest budget, this portable unit meets every requirement for conducting laboratory experiments in elementary schools. Fire-safe all-steel construction for durability. Completely self-contained! Offers maximum flexibility and efficiency! Large 48" x 30" table top.

Deluxe model larger, heavier, with Cololith top, is also made by GRADE-AID CORPORATION, leading manufacturer of all-steel classroom cabinets, sinks, and wardrobes.



SEE OUR BOOTHS 1450-52-54
AASA CONVENTION
ATLANTIC CITY N.J.
Feb. 13th to 17th 1960

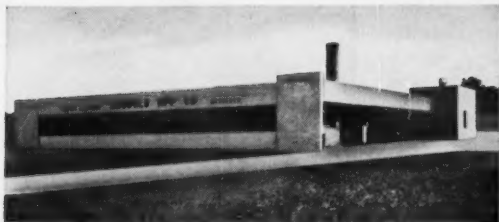
GRADE-AID Corporation
46 Bridge Street, Nashua, N. H.

GRADE-AID CORPORATION
46 Bridge Street, Nashua, New Hampshire

- ☐ Please send me complete GRADE-AID catalogs.
- ☐ Please send me the name of nearest representative.

Name _____
Title _____
Address _____
City _____ State _____

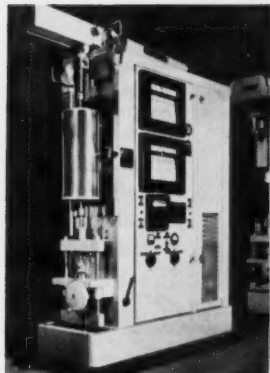
MAIL COUPON NOW FOR COMPLETE SPECIFICATIONS AND INFORMATION



THE ARCWELD MANUFACTURING COMPANY,
designer and builder of Creep Testers.



W. J. O'CONNOR, PRESIDENT of
the Arcweld Manufacturing
Company, Grove City, Penna.



THIS HIGHLY SPECIALIZED
MACHINE determines the
behavior of materials at
higher temperatures.



A NATIONAL SYSTEM provides tight control over money and
manufactured equipment for this unique organization.

"Our *National* Accounting System
saves us \$7,600 a year...
returns 133% annually on investment!"

—Arcweld Manufacturing Company, Grove City, Penna.

"In our business, each machine we manufacture represents an investment worth thousands of dollars. Therefore, it is of extreme importance that accurate records be kept on each manufactured piece," writes W. J. O'Connor, President of Arcweld Manufacturing Company. "To do this, we rely on a National Accounting System."

"Our National Class '32' provides us with multiple benefits. The wide variety of up-to-date information that is immediately available enables us to maintain control over all sales and expense distribution. It also gives us timely reports on ac-

counts receivable and payable—a valuable aid in computing our billings and current sales pictures. In addition, Federal and State Reports are now easily prepared at a considerable saving of time.

"We wouldn't be without a National System. Our National Accounting System saves us \$7,600 a year and returns 133% annually on our investment."

President of
Arcweld Manufacturing Company

THE NATIONAL CASH REGISTER COMPANY, Dayton 9, Ohio
1039 OFFICES IN 121 COUNTRIES • 76 YEARS OF HELPING BUSINESS SAVE MONEY

Your business, too, can benefit from the time- and money-saving features of a National System. Nationals pay for themselves quickly through savings, then continue to return a regular yearly profit. National's world-wide service organization will protect this profit. Ask us about the National Maintenance Plan. (See the yellow pages of your phone book.)



TRADE MARK REG. U. S. PAT. OFF.

National*

ACCOUNTING MACHINES

ADDING MACHINES • CASH REGISTERS
NCR PAPER (NO CARBON REQUIRED)

NOW COLOR

comes to the
CHALKBOARD



PURE-DUSTLESS HYGA-COLOR

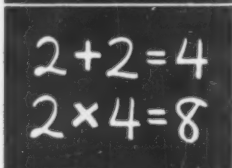
Now you can increase the teaching effectiveness of your chalkboard through color, without sacrificing the dustless, easy writing, easy erasing qualities of Hygieia Dustless white chalk!

A pure levigated chalk, free from grit, flint, or greasy binder, HYGA-COLOR is readily adaptable to every subject taught in schools.

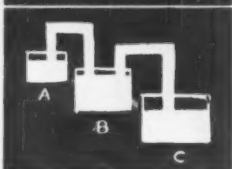
ADDS NEW
INTEREST to
geography
lessons



CLARIFIES
the teaching
of
mathematics



SIMPLIFIES
the
explanation
of science,
physics and
chemistry
problems



Free literature gladly sent on request.
Dept. NS-60.

Only Behind the Bamboo.

Frederick Nossal of the Toronto Globe and Mail visited No. 1 Primary School in Peiping, China, recently and found the children doing calisthenics in the playground and shouting in unison, "Train yourself to be healthy so you can defend your motherland and world peace!" Most of the 31 teachers in the 900 pupil school (coeducational with six grades) have just graduated from high school. The principal, Tang Hsi Hsung, explained to Mr. Nossal that the school is 50 years old and is soon to be enlarged. He found the classroom atmosphere friendly. The trend in China is toward boarding schools, Tang Hsi Hsung told the reporter. Out of Tang's own school's 900 children, 110 are boarders, "but parents of half the children at the school have applied for them to be boarders." Marvels Mr. Nossal: "Invariably their (the children's) exemplary behavior in class makes an observer think that surely school children can be so good and obedient only in a Communist state."

Hide Behind the Rompers! All was going quietly and well in the kindergarten classroom of Eva D. Hinden in an Albany, N.Y., school when suddenly a man crashed into the room followed by two armed hoodlums in hot chase. "Don't shoot those guns! Don't harm the children!" screamed the teacher. While the men tussled, Miss Hinden herded the 25 alarmed youngsters into the hall. The unidentified assailants fled without shooting and took nothing from the man they had attacked. They had lured John D. Betor, singer and grill operator, from his home and had announced a hold-up. "I gambled they wouldn't shoot," the victim explained later, saying he ran into the school to escape them.

No Speaka da English. More than 125,000 of New York City's elementary school children can't speak English. The group includes some 100,000 pupils who have come to the Big Town from Puerto Rico, with the remaining 25,000 representing foreign countries. This was told recently on Supt. John J. Theobald's weekly radio program by Elsie Wolk, who supervises the instruction of non-English speaking children in New York. While it's nothing new for a traditional port of entry like New York to have such children in its schools, Mrs. Wolk says the problem is now somewhat different. "Whereas previous generations of newcomers tended to live in a few neighborhoods, our current non-English speaking population is scattered," she states. Part of the city's efforts to overcome the language barrier include 90 special coordinators who have been assigned to schools having many such pupils. These coordinators help to train the teachers in languages.



BRONZE or ALUMINUM

MEMORIALS • HONOR ROLLS
DONOR & PORTRAIT TABLETS



LIGHTING FIXTURES

WROUGHT IRON
BRONZE
STAINLESS STEEL
ALUMINUM

ARCHITECTURAL LETTERS

BRONZE, ALUMINUM, NICKEL-SILVER
Illustrated Catalogs Sent on Request



MEIERJOHAN-WENGLER
1102 W. 4th St. CINCINNATI 3, OHIO

What you should know about Folding Chairs

Before you buy ANY folding chair let us send you the complete story of
CHANNEL FRAME CONSTRUCTION

Compare the resilient strength of Lyon channel frame construction. Compare Lyon design — backs and seats curved to match body contour — round, smooth edges and pinch-proof hinges.

Send for proof that Lyon gives more in comfort, safety and long life at the lowest possible cost.

BUILT BY
LYON®



LYON METAL PRODUCTS, INC.
226 Monroe Ave., Aurora, Ill.

Send me the complete story of Lyon Chairs and Channel Frame Construction.

NAME _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____

For every school accounting problem, a proved Burroughs answer

The equipment shown here will give you an inkling of the many ways we can help you to new efficiency in any phase of your school administrative or instructional accounting. Call our nearby branch today and have an experienced Burroughs Systems Counselor *demonstrate* the proved answer to your problem. Burroughs Corporation, Burroughs Division, Detroit 32, Michigan.



Series C Duplex Calculators—available in a wide range of capacities, electric powered or hand operated.



P-600 Accounting Machines—compact and low-priced, with many big-machine features.



Cash Registering Machines—provide positive cash control, double as adding machines. Hand or electric operation.



Duplex Adding Machines—eliminate rehandling of figures, reduce chance of error in multiple-total adding.



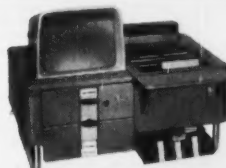
Hand-Operated Adding Machines—combine operating ease and quality results with exceptionally low price.



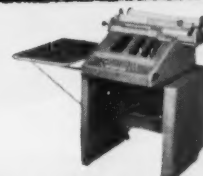
Full-Keyboard Adding Machines—available in a broad range of capacities, functions and colors to fit your needs.



10-Key Adding Machines—provide high-speed, accurate figuring. Wide choice of capacities, features, colors.



Micro-Twin Microfilm equipment—pays for itself in space and filing cabinets saved, protects vital records.



F-1000 Typing Accounting Machines—combine high-speed jam-free typing with fully automatic accounting, to give you descriptive accounting.



F-500 Accounting Machines—feature high-speed automation, operating simplicity. Switch from job to job with the flick of a knob.



Control Input Equipment—provides punched tape or punched card as an automatic by-product of maintaining accounting records.



Validating and Receipting Machines—provide tight control and protection of receipts, eliminate disputes.



Burroughs Corporation

"NEW DIMENSIONS / in electronics and data processing systems"

SEE US AT THE AASA CONVENTION. BOOTHS B-25-27-29-31.



if you haven't seen a Jennison-Wright gym floor "in action", you've got a real treat coming. They provide everything expected from an ordinary wood floor plus a lot of extras . . . extras derived only from END GRAIN construction.* They're **SPLINTER PROOF** and extremely **DURABLE**; thus safer, easier to maintain and more economical too.

When present floors need replacing or if new gyms or shops are anticipated, ask for a demonstration. Jennison-Wright representatives welcome the chance to show these unique and beautiful floors "in person" so you can "Run on it . . . and feel the cushioned flex of end grain floors.

THE JENNISON-WRIGHT CORPORATION, TOLEDO 9, OHIO

**JENNISON
WRIGHT**

**FLEXIBLE STRIP
END GRAIN FLOORS**

On the Shelf

(Continued From Page 30)

rather than self-appointed. That will take considerable doing, but it needs to be done.

L'Envoi. A last chapter on effective professional controls rounds up current thinking and measures. It ducks no issues. It recognizes that: (1) We have a need for a clearer definition of that "definitive body of knowledge" which is the first criterion of a profession; (2) ours is not private but public practice; (3) (perhaps not so clearly indicated) we are a special segment of a wider profession, and all graduate work in education is not taken in administration; (4) the degree of state leadership and control varies widely among the Fifty; (5) our accrediting organization and processes require clarification.

There are three possible courses with respect to the accreditation of administrators: (1) formation by the A.A.S.A. of its own agency; (2) cooperation of the A.A.S.A. for this task within the N.E.A. Commission on Teacher Education; (3) leaving quality control to the states and to individual associations. The commission prefers the second alternative as tending to preserve the unity of the total profession and not encouraging further proliferation of graduate schools in educational administration.

This report rightly declares that all the preparation programs in the world won't create a school administrator unless some school board somewhere first recognizes him as such. In the interest of better schools, boards must be prepared to accept only superintendents who have been professionally baptized.

The yearbook applauds the efforts which the profession has made further to professionalize itself, welcomes the press comments that hailed the A.A.S.A. membership resolution of 1959 as the greatest advance in 75 years, puts the problem of further progress squarely in the laps of the various agencies concerned, and concludes that "the profession itself must now turn with imagination and vigor to the job of paying for the high-quality preparation of the administrators we must have."

It is thoughtful and eloquent. ■

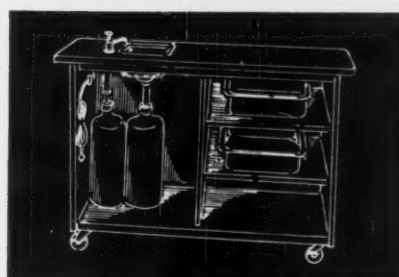
Those American Slobs. Americans lack lofty goals and high ideals and their culture level is lower than that of the Russians. So say 24 young Russian men and women back in Moscow after a month's tour of the United States, arranged under the American-Soviet cultural exchange agreement. Generally, the comrades say they believe that many of the negative aspects of American life they have read about so often at home have been confirmed.

Here's Science On Wheels For The Elementary Classroom
PORTABLE SCIENCE DESK



Now **any** classroom can be made into a small laboratory with this unique portable science desk. It's completely self contained with no connections required. Shipped knocked down for easy assembly with only a Phillips head screw driver.

Specifications include: 54" long x 28" wide x 35" high, tackboard display center on rear, high pressure laminate plastic top, 12" x 14" x 6" stainless steel sink with pump faucet, two-2½ gal. polyethylene bottles for water and waste, Bunsen burner and fuel tank with stand, two adjustable shelves, two fibre glass apparatus trays, electrical receptacle with 15' of cord and removable apparatus rod. Available in standard Flight Sweep Colors.



See our Exhibit of Homemaking, Science, Arts and Crafts at the Atlantic City AASA Convention. Booths 1422 to 1426, February 13th to 17th.

CLIP

GENTLEMEN: I am interested in obtaining free information on your Portable Science Desk.

Name _____

Title _____

School _____

Address _____

City _____ State _____

Dept. (NS)



ROYAL MANUFACTURING COMPANY, INC.
 CLAY & MEADOW STREETS / RICHMOND, VIRGINIA
 "ROYAL of Richmond"

NEW
Lighting Development
LOW IN COST
and Indestructible
WITHOUT UNSIGHTLY GUARDS

**For GYMNASIUMS
 AUDITORIUMS
 REC. ROOMS, etc.**

Maximum lighting efficiency and correct distribution with our unbreakable prismatic lens bowls. Provides lighted background for objects in flight. Perforated reflector ventilates unit and filters light to ceiling. Uses either 300 or 500 watt lamp. Lamps may be changed without ladders or scaffolds by using vacuum lamp changer. EITHER CEILING MOUNTED OR PENDANT. Catalogs with distribution-coefficiency charts are available. Our representative will show samples on request.

**CEILING or
 PENDANT TYPE**

SOLD THROUGH ALL RECOGNIZED ELECTRICAL JOBBERS IN UNITED STATES AND CANADA

UL

Luminous EQUIPMENT COMPANY
 Specializing in High Standard Quality Lighting Products
 1925 WEST WEBSTER AVENUE • CHICAGO 14

YOU TEACH ELECTRONICS EASIER, FASTER
WITH EICO KITS & INSTRUMENTS

EXCLUSIVE VISUAL TRAINING AID!
 Vacuum Tube Voltmeter
 DYNAMIC DEMONSTRATOR
 ONLY \$10.00

Simulates EICO #221 VTVM in all its functions and ranges. Helps you teach the use and reading of the VTVM with giant 13" meter scale. 14 3/4" wide x 23" high x 3 1/2" deep. Easily viewed by the complete class. Punched holes for easy hanging. Steel cabinet, aluminum panel.

EICO KITS are top-quality professional TV/radio/electronic test instruments, hi-fi components & amateur radio gear — embody latest performance-proven design and circuitry. Complete with all parts, pre-punched chassis, deep-etched aluminum panel, rugged steel case — plus pictorial diagrams; schematics; data on color codes, soldering, tools. "Beginner-Tested" step-by-step instructions help the student learn by "doing it himself" — quicken his familiarity with the construction, operation and maintenance of electronic equipment. Used by leading vocational schools, colleges & universities throughout the U.S. and the world. Over 1 million sold to date. LIFETIME service & calibration guarantee at nominal cost.

FREE **ELECTRONICS WALL CHART** of official IRE-EIA symbols, conversion tables, other reference data. Ideal for classroom instruction. **NS-2**

EICO, 33-00 N. Blvd., L. I. C. I. N. Y.
 Please send free Wall-Chart, catalog & name of neighborhood supplier.

NAME.....
 SCHOOL.....
 ADDRESS.....
 CITY.....

5-Pin Full
 VTVM #221
 KIT \$25.95
 WIRED \$75.95

VTVM #221
 KIT \$25.95
 WIRED \$75.95

RF Signal
 Generator #320
 KIT \$19.95
 WIRED \$75.95

1000 Ohms/Volt
 VTVM #516
 KIT \$12.50
 WIRED \$14.90

Coming Events

FEBRUARY

11-13. American Association of Colleges for Teacher Education, 12th annual meeting, Chicago.

11-13. United Business Education Association, national meeting, Chicago.

13-17. American Association of School Administrators, Atlantic City.

15-17. American Educational Research Association, N.E.A., Atlantic City.

27-Mar. 2. National Association of Secondary-School Principals, N.E.A., 44th annual convention, Portland, Ore.

MARCH

6-9. Association for Higher Education, 15th national conference, Chicago.

6-10. Association for Supervision and Curriculum Development, N.E.A., 15th annual meeting, Washington, D.C.

25-30. Department of Elementary School Principals, N.E.A., annual meeting, St. Louis.

27-April 2. 1960 White House Conference on Children and Youth, Washington, D.C.

APRIL

3-9. National Library Week.

17-22. Association for Childhood Education International, annual study conference, Cleveland.

20-23. National Council of Teachers of Mathematics, annual meeting, Buffalo.

24-27. National School Boards Association, annual meeting, Chicago.

JUNE

12. United Business Education Association, annual meeting, Los Angeles.

19-22. Campus Safety Association, National Safety Council, Seventh National Conference on Campus Safety, Ithaca, N.Y.

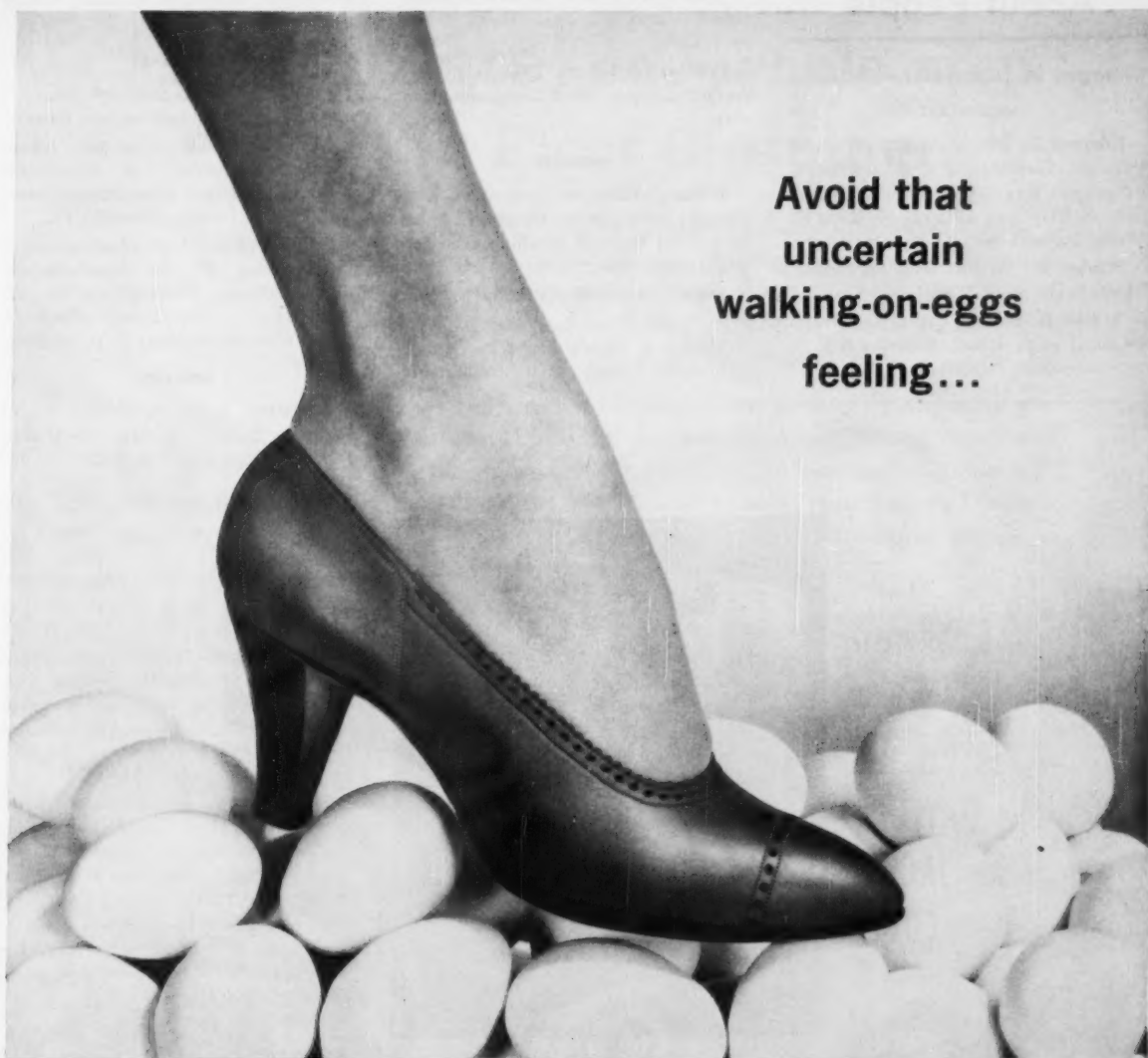
19-23. National Association of Student Councils, National Association of Secondary School Principals, annual conference, Janesville, Wis.

26-July 1. National Education Association, annual meeting, Los Angeles.

29. National Council of Teachers of Mathematics, N.E.A., joint meeting, Los Angeles.

With Russian Dressing. Subjects similar to those that have brought criticism from some American educators and laymen as "frills" are being taught in the Soviet Union, where Russian children are preparing for ballroom dancing as well as satellite launching. Jennelle Moorhead, Oregon professor of education, and a recent visitor to the U.S.S.R., says that Russian children in Grades 5 through 8 learn folk and ballroom dancing as well as other physical education subjects.

The NATION'S SCHOOLS



Avoid that
uncertain
walking-on-eggs
feeling...

**For positive traction underfoot, plus lasting beauty,
use floor wax containing LUDOX—Du Pont's anti-slip ingredient**

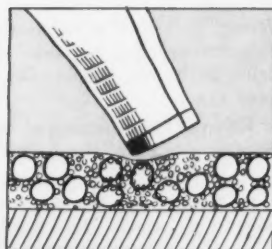
With "Ludox" in the floor wax you get added safety underfoot. "Ludox" acts like a brake that promotes easy, effortless walking. And you get the lasting beauty only a fine wax can give your floors. Scratches and scuffs can be buffed out

without rewaxing. For more information and a list of suppliers, write us or mail coupon below.



LUDOX®
colloidal silica

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY



In floor wax, microscopically small spheres of "Ludox" colloidal silica are mixed among larger wax globules. Under foot pressure the particles of "Ludox" bite into the softer wax globules, resulting in a snubbing action that makes walking more carefree and comfortable.

E. I. du Pont de Nemours & Co. (Inc.)
Industrial and Biochemicals Dept.
Room 2533NS, Nemours Bldg.
Wilmington 98, Delaware.

Please send me FREE booklet describing the advantages of using floor wax with "Ludox" and a list of suppliers of these quality waxes.

Name _____
Firm _____ Title _____
Address _____
City _____ State _____

About People

Changes in Superintendencies

NORTHEAST

Edmund B. Diehl, elementary school principal, Claysburg, Pa., to supervising principal, Greenfield-Kimmel Joint Schools, Claysburg. He succeeds Harry O. Wolfe Jr., who goes to Meyersdale, Pa.

Stanley W. Wright, West Springfield, Mass., to Haverhill, Mass.

Arnold R. Profeta, principal, Central Regional High School, Bayville, N.J., to superintendent, Palisades Park, N.J.

Maurice F. Smith, Topsfield-Wenham School Union, Topsfield, Mass., to Enfield, Conn.

William H. Galvin, assistant superintendent, Canton, Mass., to superintendent there.

MIDWEST

William Eckstrom, principal, Lake Odessa, Mich., to superintendent there, succeeding Maxwell Hamilton, who goes to Fremont, Mich.

Donald R. Lidikay, Pratt, Kan., to Liberty, Mo.

Mahlen H. Moore, high school principal, Midland, Mich., to assistant superin-

tendent and director of secondary education there.

SOUTHEAST

Frank E. Flora, high school principal, Radford, Va., to superintendent there.

George Maxwell, elementary school principal, Melbourne, Fla., to assistant superintendent for administrative services, Brevard County, Titusville, Fla.

Arthur Cotterill, high school principal, Flemingsburg, Ky., to superintendent, Fleming County, Flemingsburg, Ky., effective July 1. He succeeds Frank D. Scott, who retires after 16 years there.

WESTERN

Ferdinand J. Kiesel, Unified School District, Fontana, Calif., to Unified School District, San Juan, Calif.

Other Appointments . . .

Harry H. Henderson has accepted the appointment as superintendent, state training school, Lander, Wyo. He succeeds G. M. Willson, who retires after 32 years there.

M. B. Robinson, assistant superintendent, area trade schools, Columbia, S.C., to superintendent there. He succeeds B. R. Turner, who becomes technical supervisor and consultant of the area trade schools.

Joseph D. Moore, principal, Lansdowne-Aldan High School, Lansdowne, Pa., has been appointed director of secondary education, Paoli Area High School System, Berwyn, Pa.

George D. Stoddard, dean, school of education, New York University, has been appointed executive vice president of the university.

Resigned . . .

Ralph L. Shattuck, Middletown, N.Y., effective July 31.

C. Willard Cross, Faribault, Minn., effective September 1. He has been in the Faribault school system 33 years.

Retirements . . .

C. N. Brandon, superintendent for 31 years in Columbus, Miss., effective July 1.

William E. Chalmers, superintendent, Cooke County, Gainesville, Tex.

Died . . .

F. J. Penley, 63, retired superintendent, rural district, covering the towns of Avon Heights, Burlington, Granby, Canton and Avon, Conn.

H. Paul Kelsay, 71, superintendent of St. Joseph County, South Bend, Ind., since 1947.

Bertha R. Palmer, 79, former state superintendent of schools for North Dakota.

8 Different
Size Books
Take 1 Size
GAYLORD
JACKET
COVER

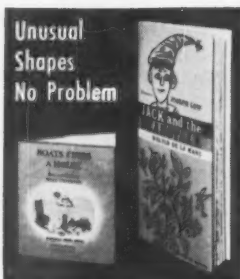


Stock Only 6 Sizes to Fit Most ALL Books

Gaylord Book Jacket Covers offer you the ease, convenience and economy of stocking only six sizes to fit most books from 7½" through 16". Each of the six adjusts to various books, easily, quickly. Covers are easy to apply: only one single fold needed, to conform to exact jacket dimension. Exclusive design, prefolded at the bottom and complete with white kraft liner sheet, gives double thickness at the point of most wear. Made with heavier weight 1½ pt. (.0015") Mylar* for greater protection — gives a trim, neat fit and true quality feel.

Send for illustrated folder and complete information.

*DuPont trademark for its polyester film.



Book Jackets of unusual size or proportion are easily covered with one of Gaylord's six sizes.




library
supplies

Gaylord Bros., Inc.

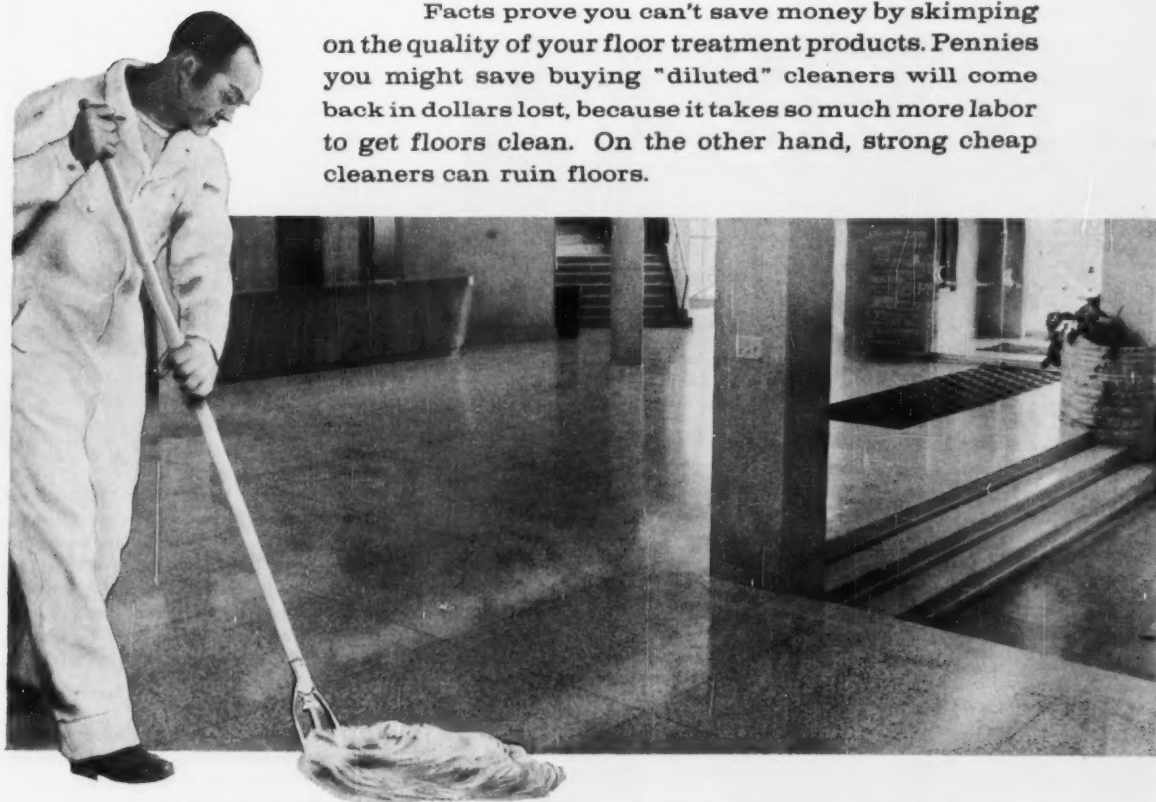
SYRACUSE, N.Y. STOCKTON, CALIF.

"the house of prompt, friendly, personal service"

Eliminate one whole step in Floor Cleaning!

SUPER SHINE-ALL® cuts labor time; eliminates the whole step of rinsing in normal cleaning. Its extra cleaning quality neutralizes the toughest floor soil problems, without a trace of harm to finest flooring.  listed for slip resistance.

Facts prove you can't save money by skimping on the quality of your floor treatment products. Pennies you might save buying "diluted" cleaners will come back in dollars lost, because it takes so much more labor to get floors clean. On the other hand, strong cheap cleaners can ruin floors.



Whether **CLEANING • SANITIZING • SEALING • FINISHING • WAXING** or **SWEEPING**
You're Money Ahead with

Let the
Hillyard "Maintaineer®"
survey your floors and
show where you can save
money on floor care. He's
"On Your Staff, Not Your Payroll"

H I L L Y A R D
Pessac N. J. ST. JOSEPH, MO. San Jose, Calif.



HILLYARD

HILLYARD St. Joseph, Mo. Dept. E-4

☐

Please send me Free book of facts
on actual cases of floor care sav-
ings.

☐

Please have the Hillyard Main-
taineer get in touch with me. No
obligation!

NAME _____

FIRM OR INSTITUTION _____

ADDRESS _____

CITY _____

STATE _____

Branches and Warehouse Stocks in Principal Cities

A.A.S.A. Book, "Planning America's School Buildings," Probes Principles Governing Ultimate School Design

Planning America's School Buildings. By members of School Building Commission, American Association of School Administrators, Shirley Cooper, A.A.S.A. associate secretary, chairman. Foreword by Finis E. Engleman, executive secretary. Published by the association, 1201 Sixteenth St., N.W., Washington 6, D.C. Pp. 240. \$6.

THERE comes a time in the school-house planning process when there must be merged into clearly conceived

concepts, and spelled out in terms of space and facilities, all that needs to be done through the instructional program. This includes everything that is known about how children learn and behave and how teachers and administrators work. Reflected will be: values, needs and goals; practices, procedures and methods; organization, materials and equipment.

So states "Planning America's School Buildings," the most recently published addition to construction literature, written by A.A.S.A. School Building Commission members.

Members of the commission, in addition to chairman Cooper, are: Charles R. Colbert, architect, New Orleans, La.; William H. Curtis, supervising principal, District No. 4, Brookhaven, Bellport, N.Y.; Charles D. Gibson, chief, Bureau of School Planning, State Department of Education, Sacramento, Calif.; Robert S. Gilchrist, superintendent of schools, University City, Mo.; John W. McLeod, architect, Washington, D.C., and Arnold S. Tjomsland, director of school plant facilities, State Board of Education, Olympia, Wash.

Special contributors were: William J. Ellena, assistant executive secretary, A.A.S.A., Washington, D.C., and George W. Holmes III, School of Education, University of Virginia, Charlottesville.

Essentials of Building Design

Elaborating upon their philosophy of pupil housing, the writers continue:

"Creativity, imagination, invention — these are essential to the design of a good school building. The building must provide an environment which excites the imagination and challenges the abilities of those who use it. Ideals and values we want taught to our children — esthetics, order, proportion, strength, sensitivity, compassion, spiritual values, courage — should be embodied in the school building. If this is accomplished, the structure itself becomes an important tool for teaching, an essential and integral part of the process of education."

Hampering this creative process, say the authors, is our knowledge of schools as they are, which limits our imagining schools as they might be. Too often we are actually afraid of the kind of environment we think appropriate for a democracy. When we are hampered by what is, it is difficult for us to see what might be.

Beauty Is Basic

One of the important elements in the design of new school buildings, and one of the basic needs of the growing child, is beauty, the book states. "Good buildings have a capacity for attracting beauty unto themselves and then transmitting it into the lives of those who have been intimately associated with them. A child's ability to see and appreciate physical beauty is nurtured by his surroundings. Should not then his schoolhouse contribute toward his feeling for beauty?"

Beauty need not be expensive. It can be inherent in function or form, or be the result of creativity. The challenge is its wisest use for the greatest possible educational benefit.

Before one can bring into being a school building fully adequate to all the demands made upon it, one must understand the exact nature of the relationship existing between educational requirements and the needs for space and facilities, the text states. (Cont. on p. 166)

from STACOR ...new functional units for your school

THE FLEX-MASTER MULTI-STUDENT LIFETIME QUALITY INDIVIDUALIZED DRAWING UNIT NL-1200



provides open working surface and horizontal board storage facilities for **12** students

- Efficient
- Economical
- Space-saving
- Private

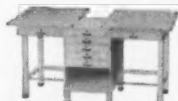
• Drawers have individual locks, masterkeyed . . . hold boards up to 20 x 26 in horizontal position plus tools, other material.



for 10 students
the DU-1000



for 9 students
the DU-900



for 7 students the DU-700



for 6 students
the DU-600



8-drawer
cabinet unit
the DU-800



5-drawer
cabinet unit
the DU-500



Dual boards and
drawer space for 12
the DU-1200

Write TODAY for complete NEW catalog. Dealer Inquiries Invited.

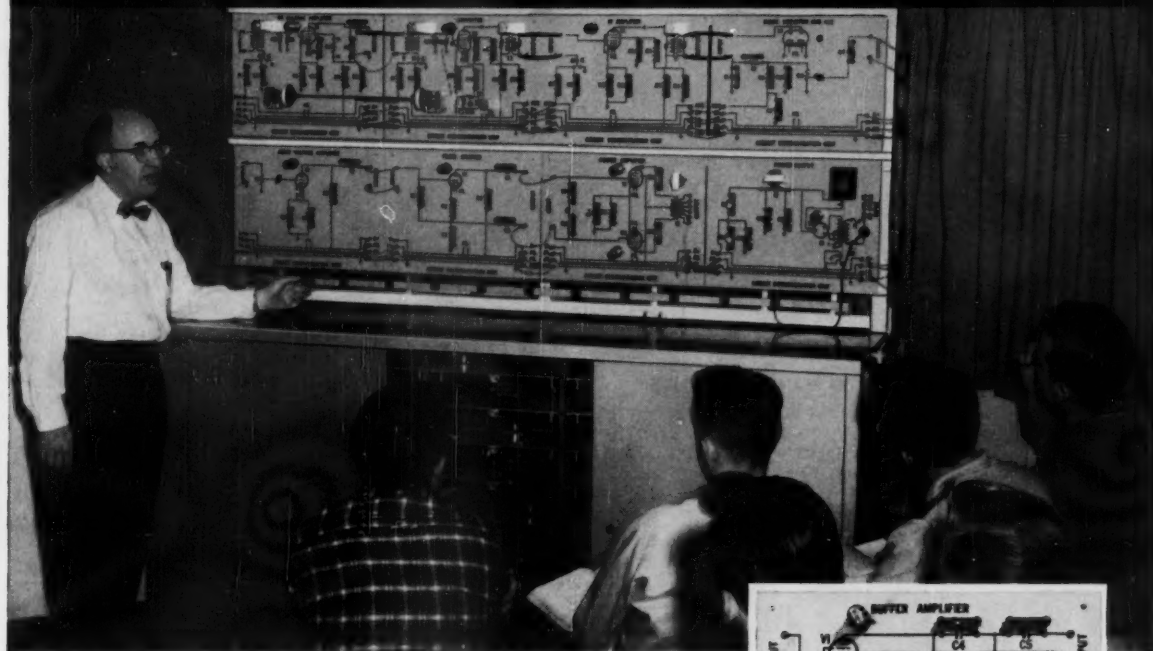


Manufacturers of Lifetime Quality Drafting
Equipment for Schools and Industry
STACOR EQUIPMENT CO.

311 Emmet Street, Newark 5, New Jersey • Bigelow 2-6600

**Schools increase
electronics training with
aid of Defense Education Act**

Schools from coast to coast are utilizing the financial aid of the National Defense Education Act to bolster electronics training programs. Approved purchases to date show interest centered on up-to-date electronics training equipment and materials.



BUCKS COUNTY AREA TECHNICAL SCHOOL LOCATED AT FAIRLESS HILLS, PA.,
GEORGE M. SCHAFER, PRINCIPAL

Philco Electronics Programs Geared to Modern Technologies

One, two and three year programs integrate texts, lecture demonstrations, lab units, work books and tests

Philco Electronics Training Packages employ proven methods to make teaching easier and give students a better understanding of electronics theory and applications.

The Philco Electronics Classroom Demonstrator presents the circuits of electronics theory and equipment a step at a time with easily learned "building block" circuit panels. Complete and functioning systems are formed by combining these a block at a time on the rack of the console. Students learn by doing with lab chassis that correspond to each "Building Block" circuit panel.

Classroom demonstrations, laboratory experiments and tests are completely organized for the teacher in the instructor's manual... and all are correlated with the text book. Students' work books provide direction and guidance.

The console houses as many as 40 different "Building Block" panels in its cabinet base. Entire console unit moves easily on its own casters and plugs into any regular A.C. outlet. No building modifications needed.

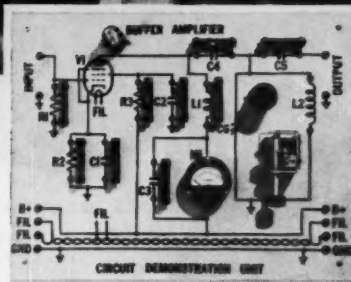
Programs can be tailored to suit the specific training needs of any school or community.

For further information, please write:

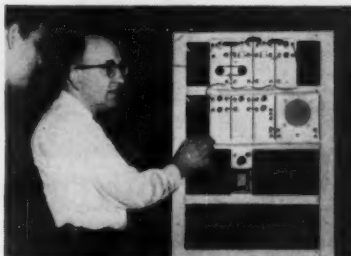
PHILCO TECHREP Division

"C" and Ontario Streets

P.O. Box 4730, Philadelphia 34, Pennsylvania



Building Block Circuit Panel—Each is a basic circuit... function and relationship to entire system are easily explained as it is added on the demonstrator.



Matching Lab Units—For each "building block" circuit panel there is a matching lab chassis, a complete and operating counterpart unit for laboratory experimentation.

GRASS IS HERE TO STAY ...is your mower?

invest in a
and save!
COMPARE:



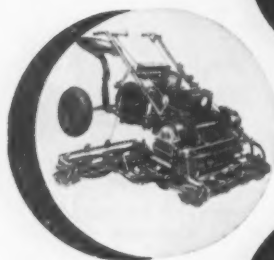
● MANEUVERABILITY

A LOCKE turns at any angle. Overhangs raised borders by $\frac{1}{2}$. Cuts trimming time in half; leaves no streaks, rolled or uncut grass. Does yours?



● SERVICE

LOCKES are sold and serviced only by specialists, averaging 23 years in business. They must meet our code of ethics. Who services yours?



● LONG TERM EQUIPMENT

A LOCKE'S life expectancy is 3000-4000 hrs. (14 to 19 yrs.) What's yours?



● DEPRECIATION

A LOCKE'S dollar depreciation averages 57% in 10-19 yrs. (Others: 69% in 10-14 yrs.) What's yours worth today...10 years hence?

SINGLES: 25" and 30"
Plain or reverse
2½, 5 h.p. 4 cycle engines
TRIPLEX: 70" and 75"
Plain or Reverse
7, 9 h.p. 4 cycle engines
Sulkies Attach.



POWER LAWN MOWERS

1311 Connecticut Avenue

Bridgeport 1, Conn.

A product of Locke Steel Chain Co.



Send for
these New
Locke
data sheets

Now is the time to take your grass cutting costs seriously. ASK YOUR LOCKE Service Dealer for the facts, or write.

Locke Mower Div.
Locke Steel Chain Co.
1311 Connecticut Ave., Bridgeport 1, Conn.

Gentlemen: We are most certainly interested!

☐ Please have your dealer phone me.
☐ Send your latest literature.

NAME _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

The three kinds of space needed in school plants are classified broadly into three categories: home bases, specialized learning areas, and space for special services and functions.

On the superintendent, the book emphasizes, lies the great responsibility of viewing the proposed school plant in its entirety. He must maintain an appropriate balance, keeping in mind at all times the needs of the children whom the school serves, of the teachers, and of the community. "The school plant thus will not then be a series of isolated facilities that happen to be located in a cluster in a single site. The school plant when it is completed will be a completely knit entity of instructional facilities."

How Not To Plan

A discussion of the planning process constitutes one chapter of the book. "Let no one be misled — the process by which a school district arrives at decisions concerning its building program is a vital factor in determining the kind of educational program provided the children and youth of that community."

The superintendent or any other official should not place himself, and himself alone, in the roles of educator, planner, architect and contractor, the book cautions, lest he create a climate that will tend to develop an autocratic learning situation, one not in accord with democratic principles. On the other hand, the writers state: "In a school district where the superintendent uses his status as a leader to involve others in identifying and solving educational problems, a climate is created that will produce a learning situation reflecting the processes and educational needs of our American society."

Discusses Light, Ventilation

The book devotes considerable space to thermal, visual and acoustical environment. Excessive ventilation requirements of some codes are criticized. The importance of orientation and adequate shielding of buildings for the control of daylight is discussed. Stress is placed on the fact that daylight should no longer be regarded the prime source, supplemented by electric light. The decision as to whether the 70 foot-candle lighting level advocated by the lighting industry will do better on a particular job than one of 30 foot-candles rests with the local administration, but the problems of reflected glare should not be overlooked.

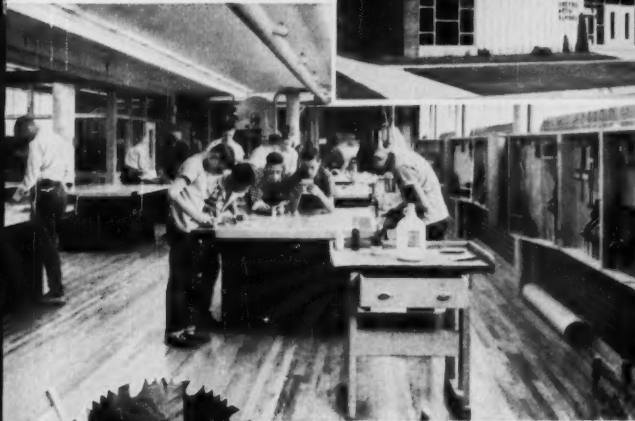
As yet there are no precise answers to questions regarding the most desirable television facilities. Thus it would seem wise to provide as much flexibility as possible in the structural arrangement of a building, keeping in mind ETV's potential for the future.

Under the chapter title, "Leadership

Pedigo Useful Arts School, Pratt, Kansas; Thomas-Harris-Calvin, Wichita, Kansas, architects.



(Below, L) Main woodworking shop; (Below, R) Junior High shop; both areas floored with conventional strip Northern Hard Maple flooring.



favorite floor of folks with feet!

for school shop areas
multi-purpose rooms
gymnasiums

Versatile NORTHERN HARD MAPLE

Nearly all educators and architects have feet. So do most school pupils. Indeed, feet are so usual there's an aphorism which goes: "to forget all but one of your troubles, wear shoes that are too tight." Because it is so very *foot-friendly* Northern Hard Maple is the favorite modern school flooring. It's warm and firm—a comfort to stand on all day. It's bright, tight, tough-fibered, almost incredibly enduring, and is swiftly renovated. ("Always a new floor underneath!") *Important in shops*—edged tools, dropped on Maple, aren't dulled or ruined, and power-tool anchorage is simpler. Mr. Robert B. Harris of Thomas-Harris-Calvin, architects for the Pedigo Useful Arts School, expressed it succinctly: "... we feel that Maple Flooring for shop areas is the best suitable material."

Mr. Harris' words express no whim. In a recent nation-wide survey three out of four Industrial Education directors stated they preferred hardwood over all other commonly used shop floor materials, except in Auto Mechanics areas. And the nation's great textile mills and bakeries use hundreds of acres of Northern Hard Maple.



Woodworking shop, Barrington School, Barrington, Ill. Architects, Perkins & Will, Chicago. Patterned floor of Northern Hard Maple, laid in mastic. Photograph, courtesy Hedrich-Blessing, Chicago.



Multi-Purpose Room, St. Mary's School, Hammond, Ind. Architects, Bachman & Bertram, Hammond. Conventional strip flooring of Northern Hard Maple.



MAPLE FLOORING
MANUFACTURERS
ASSOCIATION

Suite 589
35 E. Wacker Drive
Chicago 1, Ill.

See Sweet's—13j-MA—and write for new MFMA Specification Manual and list of laboratory-tested, MFMA-approved floor finishing products.



and the Capital-Outlay Program," all aspects are treated from initiating the first steps of schoolhouse planning to the ultimate stages of financing.

There is a long discussion of educational specifications as complete and precise statements in terms of the educational program. The development of "specs" should be the result of a strong cooperative effort of professional staff, other planning groups, and the consultants.

"What should a good school building cost?" asks the lead sentence of another chapter. The answer reflects such variables as economic condition, planning procedures, geographic location, size of

project, type of building, the quality of building materials and construction, and the program requirements. Many communities have been able to improve their facilities without additional cost or at reduced cost despite the steady rise in the cost of materials and labor.

Dismisses Stock Plans

Stock plans are dismissed summarily because they "actually have been tried in some 16 or 17 states with very little success." Although the cost of prefabricated schools "generally has been considerably less than expected," mass producing of **basic modules** is favored. With present labor costs constituting 60 per

cent of construction costs, an expensive material prefinished at the shop in many cases may result in a lower building cost.

The "obsession" of comparing the cost of school buildings is scorned, since such figures reflect dimension measuring techniques on which authorities do not agree. "If the finished product has provided students and teachers with a building which is at once spatially adequate and environmentally satisfying, then the community will know it has received good measure."

The final two chapters deal with the rehabilitation of existing school buildings and their operation and maintenance.

To rebuild or to rehabilitate? The right answer to this question may be evident only after an objective evaluation report has been prepared. Educational, structural and electrical adequacy and fire safety aspects must be determined. Original drawings should be studied.

'Organize for Maintenance'

Because the modern school is a complex structure within which there exists an intricate maze of wiring, piping, duct work, and innumerable controls, the administration must organize for maintenance. Responsibility must be fixed, personnel hired and trained, work inspected. Priorities must be set up, a budget maintained, purchasing procedures determined. Regarding all of these matters helps are offered. The authors also promise that by keeping in mind the operation and maintenance aspects of the proposed plant during the planning stages many long-term savings can be realized by the school district.

For those seeking aid on methods and systems of predicting pupil population, one chapter outlines a variety of forecasting and projection techniques. Yet the conclusion of this section reads:

"To date, no exact method or formulas have been developed which can predict future changes in population in localized areas with a high degree of accuracy. To compensate, as many methods as possible should be used; only reliable data should be employed, and estimates should be revised as often as new data are available. Predictions beyond five years into the future must be regarded as speculation only."

Concerning site selection the volume states: "Selection of a site should follow, not precede, the lengthy process of surveying community service agencies, analyzing administrative organization and patterns of community life, and developing the educational program. The wise site selection method is a continuing, long-range approach."

The architect, the book counsels, should always be a member of the site selection group since he sees buildings "as related to contours, approaches from

"Really!



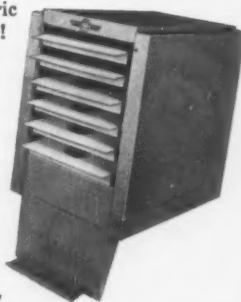
Prices slightly higher Denver and West.

...our Thomas Collator earns its
\$149⁵⁰ cost every 2 months!"

Time savings does it! With the *Gatherette* electric collator one girl collates where before it took three!

What's more, she does it comfortably at her desk. And when she's finished, the lightweight and compact *Gatherette* is no trouble to put away.

Why continue tiring, time-wasting hand gathering of duplicated sheets into sets? A *Gatherette* can work wonders in savings and morale! The Thomas people will gladly demonstrate that. Write them today and see.



Thomas Collators Inc.

100 Church St., Dept. V1, N. Y. 7, N. Y.



1 1/2 2

WHY MORE THAN HALF OF ALL TYPEWRITERS USED IN SCHOOLS ARE ROYALS:

- 1** Royal's tough construction easily takes all the pounding dozens of different students give it through the years. Result: longer teaching life, less spent on service.
- 2** Time-saving, exclusive Royal features such as MAGIC® MARGIN and TWIN PAK® speed up teaching, make learning a whole lot easier.
- 3** There are more Royal Standard Typewriters in office

use today than *any* other typewriter.

- 4** Royals bring up to 24% more in re-sale than the other makes of typewriters.

See for yourself. Ask your Royal Representative for free Value Analysis Forms *you fill out yourself*. They'll show you how Royal beats out any other typewriter in the long run, in the short run, any way you look at it.



ROYAL®
standard

Product of Royal McBee Corporation, World's Largest Manufacturer of Typewriters



**No matter what
the subject...**

**RCA Electronics helps
you teach it better**

Take any subject from Algebra to Zoology; Science to Social Studies—and see how RCA Electronics animates and enlivens it through the vital dimensions of sight and sound. Teachers find it easier than ever to keep students interested, for every one of these new RCA Audio-Visual Teaching Aids impress facts faster and do it so they're retained longer.

RCA "Life-Tested"* Projectors light any subject with bright new appeal. Senior and Junior models are simplest to operate, easiest to thread of any 16 mm projector. And they run quietly, feature built-in lubrication, treat film with a velvet touch, put more light on the screen with 1200 watt lamps. Porto-Arc projects extra-brilliant, large-screen pictures.

RCA "Scholastic" Record Players are designed for years of rugged usefulness. They're built for simple



student-proof operation, yet their "Tri-Coustic" Speaker systems reproduce sound with high fidelity realism. RCA Stereo Cartridge Tape Recorder operates with push-button ease. Cartridges snap into place instantly, ready to play or record stereo or monaural sound.

With RCA Language Laboratories, a *spoken* as well as written language is learned. Tape recorded lessons that *talk* stimulate student interest and breathe new life into foreign languages.

Consider any subject in *your* current curriculum. Your RCA Audio-Visual Dealer can show you exactly the Audio-Visual Aid which makes it easier to teach, easier to understand. Look in your Classified Directory under "Motion Picture Equipment and Supplies." Now's a good time to call . . . or write us for informative literature.

**Rigid endurance standards have been set for RCA "LIFE-TESTED" Projectors. Individual components as well as finished projectors are subjected to continuous testing to evaluate the durability and efficiency of all operating parts. "LIFE-TESTED" at RCA means better, more reliable performance from RCA Projectors.*

(left to right) Junior Projector; Porto-Arc Projector; "Scholastic" Portable Record Player; Senior Projector; Language Laboratory Components; Stereo Cartridge Tape Recorder.



RADIO CORPORATION of AMERICA

AUDIO-VISUAL PRODUCTS • CAMDEN 2, N. J.

access streets, esthetic tone of the site, and the natural features which lend themselves to accenting building masses or providing the land breaks that so often give the extra touch of character." The evaluation of the structural engineer, civil engineer, landscape architect, traffic engineer, and real estate broker also will be helpful, since each man is probably seeing a "picture in his own head" unlike that of any other member of the group.

Predictions and Trends

The opening chapter of the A.A.S.A. publication is a philosophical scanning of the history of education. School buildings

are reviewed in the light of changing cultures; their symbolism for society and for the local community is interpreted.

The second chapter takes a good look at "The Midcentury Boom in Schoolhouse Construction." The results of the trend toward school district reorganization, population swells, and more schooling for all are reduced to tables. These provide a wealth of statistics, including data on live births, capital outlay per pupil, enrollments in public schools, and total classrooms constructed.

Emphasis throughout the volume is placed upon the tremendous difficulty inherent in the task of planning school housing. The problems cannot be fully

comprehended until one realizes that today's building plan must serve not only the needs of present children but also those of our grandchildren and great-grandchildren, it is explained. Will it be flexible enough to make future adaptation easy?

Predicting that America's most rapidly growing quarter of a century lies immediately ahead, the authors anticipate that the ungraded or nongraded primary school concept will probably influence elementary school organization and design during the next several years or decades.

Findings of extensive research into the problems of how adolescents learn, the basic drives that motivate them to action, and their needs for living in the foreseeable future clearly point to "the urgency for breaking away in the secondary school from the present lock-step of organization for instruction."

Trends that more recently have made it necessary to plan a different type of school structure than that suitable a generation or two ago are listed. These include: an increasing emphasis on a more penetrating, comprehensive, and far-reaching guidance program; provisions for science education facilities; a curriculum of social studies that will cast the people of this country in a role of world leadership, which they did not seek, and the use of mass media of communication and instruction. Adult education facilities and the year-round school also have raised problems that remain very real, the authors conclude. — L. E. B.

President Says Education Local, Personal Responsibility

WASHINGTON, D.C. — In his State of the Union address, President Eisenhower offered little encouragement to those hoping for passage of the Murray-Metcalf bill or similar legislation granting generous federal support to education.

"We cannot be complacent about educating our youth," he stated. "But the route to better trained minds is not through the swift administration of a federal hypodermic or sustained financial transfusion.

"The educational process, essentially a local and personal responsibility, cannot be made to leap ahead by crash, centralized governmental action."

The President urged Congress to take action on a program proposed by the Administration to help eliminate "current deficiencies in the educational system.

"It is designed to stimulate classroom construction, not dollars for state and local use by substitution of federal funds, but by incentives to extend and encourage state and local efforts. This approach rejects the notion of federal domination or control," he said.

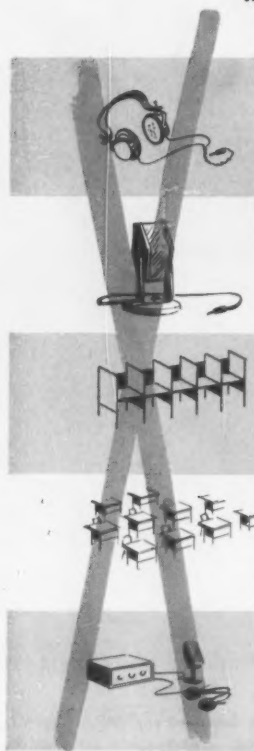
Simplify

and lower the cost
of your Language Laboratory
install the *Cousino*



VOICE-FLECTOR*

PORTABLE ORAL PRACTICE
INTERCOMMUNICATION AND ISOLATION



A 5 IN 1
solution for
problems of: SPACE
PERFORMANCE
COST

VOICE-FLECTOR*, complete with speaker, microphone,
adjustable stand, connecting cord and plug: **\$4950**

*Registered trade mark, patents pending

10 POSITION CONSOLETTTE LANGUAGE LABORATORY SYSTEM

\$996⁰⁰

complete

COUSINO CONSOLETTTE Language Laboratory systems encourage maximum tutorial instruction with uninterrupted class recitation and oral practice. Standard 10, 20 and 30 position CONSOLETTTES feature simplified controls for selective broadcasting of oral practice material, instructor monitoring of student practice, instructor-student intercommunication and instructor recording of student recitation.

The COUSINO MAG-MATIC TAPE REPEATER frees the instructor from repetitive oral recitation. Endless magnetic tape loops repeat oral practice lessons without attention. ECHO-MATIC tape cartridges provide tamper-proof protection for the tape and instant, fully automatic threading of the MAG-MATIC TAPE REPEATER.

The COUSINO VOICE-FLECTOR applies principles of acoustic reflection for simplest, most natural student self-monitoring or "hearback" of his own response during oral practice. Lightweight, rugged and portable, the VOICE-FLECTOR performs functions of "hearback" amplifier, earphones, microphone and isolation booth.

Cousino

ELECTRONICS CORPORATION
2107 ASHLAND AVENUE, TOLEDO 1, OHIO • PHONE CHERRY 3-4208

This Is The Pattern For All-Weather Track Activity

Nationwide, schools and colleges are gearing-up for all-year, all-weather track and field activities on Grastex®. For spikes or rubber soles.

Latest major University to build a full-scale Grastex track is the University of Wisconsin.



CLOSE-UP OF UNIVERSITY OF FLORIDA TRACK

GRASSTEX All-Weather Running Tracks

Don't let your team be penalized by the limitations of a conventional cinder or clay track. And stop paying the high maintenance bills these types of tracks require. Get all the facts, today, on *All-Weather, Low-Maintenance Grastex Tracks* from our nearest office.



American Bitumuls & Asphalt Company

320 Market St., San Francisco 20, Calif.

Perth Amboy, N. J.
Baltimore 3, Md.
Cincinnati 38, Ohio

Atlanta 8, Ga.
Mobile, Ala.
St. Louis 17, Mo.
Tucson, Ariz.

Portland 8, Ore.
Oakland 1, Calif.
Inglewood, Calif.
San Juan 23, P. R.

Rauland

the most desirable central control all-facility school sound systems

RAULAND School Sound Systems are unsurpassed for versatility, rugged performance and value. They perform every conceivable communications function for administrative control, educational program distribution and 2-way communication. Here, truly, is the most desirable choice in budget-minded School Sound, designed and built to stay modern for years.



your choice of every desirable feature and program facility

RAULAND Sound Systems are available to fit the exact needs and budget of your school. Available features include:
FM-AM Radio—selects any radio program on FM or AM for distribution to any or all rooms.

Phenograph—distributes phono program (transcription player or record changer); also available for use with tape recorder.

Microphones—selects and distributes programs from multiple microphone locations.

Intercom—permits 2-way conversation with any or all rooms.

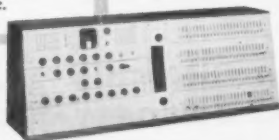
Special Features—Emergency Switch; all-call; provision for signal clock; telephone intercom; fire-disaster alarm facilities; remote control, etc.

S500 Series

Deluxe 3-Channel Systems; maximum facilities—two channels for unprecedented program choice, PLUS intercom; with hi-fi FM-AM tuner and stereo record changer; distribution facilities for up to 220 rooms...

Model S502-36

Deluxe 3-Channel System including intercom; a budget-minded basic system with expandable facilities for up to 120 rooms...



There is a RAULAND Sound System to fit the exact needs and budget of your school.

WRITE FOR FULL DETAILS

RAULAND-BORG CORPORATION Pioneers in School Sound

Rauland

Rauland-Borg Corporation, Dept. N
3535 W. Addison St., Chicago 18, Ill.

☐ Send full details on all RAULAND School Sound Systems
Our school has _____ classrooms.

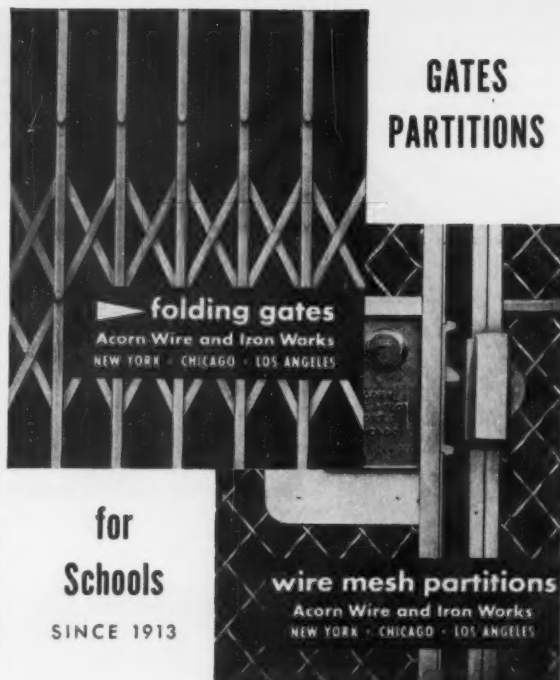
Name _____ Title _____

School _____

Address _____

City _____ Zone _____ State _____

GATES PARTITIONS



for
Schools

SINCE 1913

folding gates

Acorn Wire and Iron Works
NEW YORK • CHICAGO • LOS ANGELES

wire mesh partitions

Acorn Wire and Iron Works
NEW YORK • CHICAGO • LOS ANGELES

Acorn Wire and Iron Works

4940 S. Kilbourn Avenue • Chicago 32 • LUDLOW 5-0600

NEW YORK
101 Park Avenue
MURRAY HILL 9-7370

LOS ANGELES
1709 W. Eighth Street
HUBBARD 3-4747

GOUGLER



MASTER KEY COMBINATION LOCKS

These sturdy, high security locks use a new type master key, not duplicable on key machines, for proper control and maximum protection. They feature "clicking" combinations, no need to read, just count clicks and open—even in the dark.

Type
No. 40

Similar non-master key lock, No. 30/1, available.

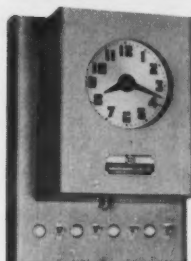
Gougler Locks are used by: Seward Park High, New York, N. Y.; Parkway Jr. High, Ft. Lauderdale, Fla.; Baldwin High, Pittsburgh; and many others. Free records of combinations with all orders.

Write for sample, prices and 2 years credit plan.

C. L. GOUGLER KEYLESS LOCK CO.
711 Lake St. Kent, Ohio

SIMPLICITY OF OPERATION LOW COST OF MAINTENANCE

These two factors, in city after city, are dictating the replacement of complex, elaborate, high maintenance systems with dependable Montgomery Synchronous Program Clocks. Investigate! Ask your school supply dealer or write for details.



MODEL A



MODEL M & L

Montgomery

SYNCHRONOUS PROGRAM CLOCKS

WITH AUTOMATIC CALENDAR SWITCH

NEW! MULTI-CIRCUIT — provides complete automatic operation of 1 to 5 separate schedules on 1 to 5 groups of signals. Signals adjust from 2 to 25 seconds. Calendar switch regulates automatic operation. Clock and program mechanism set by turning hands. Special signals, by push-buttons, do not disturb automatic operation. 12 or 24 hour models.

ONE AND TWO CIRCUIT — Complete automatic operation of 1 or 2 circuits on pre-arranged schedules. 12 or 24 hour models with 2 to 25 second signals. Regulated by automatic calendar switch. Perfect synchronization; set by turning clock hands. Push-buttons for special signals do not disturb automatic operation. Easily installed in new or existing system.

MONTGOMERY MFG. CO.
OWENSVILLE, INDIANA



Soundguard

... new folding partition separates both space and sound effectively

You can now assure quietness in classrooms—contain cafeteria noises—divide lab and auditorium areas effectively . . . with **SOUNDGUARD**. Soundguard is the folding door that offers maximum sound reduction. This is due not only to Soundguard's denser sound insulation within the partition itself, but also to the complete perimeter sealing—the tight seal that blocks sound from passing around jambs and operating edges. An outstanding Soundguard feature!

Soundguard has a rugged steel frame covered with beautiful vinyl fabric which withstands abuse—assures long, active life and easy maintenance.

Other **FOLDOR** models include narrow profile doors for wardrobe applications. There's a **FOLDOR** door or partition for every school use.



FiliGrille . . . new and different, functional and decorative. A $\frac{3}{4}$ " thick styrene grillework in standard designs, factory fabricated in customized panels. Ideal as space dividers and screens. FiliGrille is offered in a variety of complete framing systems adaptable to any school application.



Monroe FOLD-KING

FOLDING CHAIRS
All steel, also plywood or padded seat. Complete line. Direct prices, discounts. See Catalog.

TABLE and CHAIR TRUCKS
the leader, 7 models, sizes — for transporting, storing. Smooth rolling, easy loading. See Catalog.



Announcing NEW Monroe FOLD-KING TABLE LINE

FREE—NEW 1960 CATALOG AND DIRECT-TO-INSTITUTIONS PRICES

Kitchen committees, social groups, attention! Direct-from-factory prices—discounts up to 40%—terms. Churches, Schools, Clubs, Lodges and all organizations. Our new **MONROE 1960 FOLD-KING FOLDING BANQUET TABLES** are unmatched for quality, durability, convenience and handsome appearance.

NEW—Completely automatic lock on pedestals and legs. "Snap" them rigidly in place, or folded flat. New pedestal and frame construction.

Mail coupon, write, wire or phone for our beautiful new catalog with color pictures of Folding Tables, Folding Chairs, Table and Chair Trucks, Portable Partitions, Bulletin Boards, Folding Risers and Platforms.

MAIL THIS SPECIAL COUPON TODAY!

Please send the new 1960 Monroe FOLD-KING Catalog—prices, discounts, terms.

Name of church, organization _____

Mail to _____

Title _____

Address _____

City _____

Zone _____

State _____

We are interested in (Tables, Chairs, etc.) _____

THE MONROE COMPANY 76 Church St. COLFAX, IOWA

Holcomb & Hoke Mfg. Co., Inc. Dept. A1231
1545 Van Buren Street, Indianapolis 7, Indiana

Please send complete information on:

☐ FOLDOR Soundguard ☐ FiliGrille grillework

NAME _____

ADDRESS _____

CITY _____

STATE _____



Look what's happened to the old oaken bucket!

Years ago, the hardest working part of a mopping outfit was the moppers' knees. Couldn't do much about changing *their* design but the bucket and what passed for a wringer were ripe for improvement.

Look at today's bucket brigade by Geerpres! Gleaming, rugged, easy to use and move—this is the way a bucket should be. Add a Geerpres wringer—engineered answer to mop

wringing efficiency—and floor mopping becomes almost a science.

Yes, the old oaken bucket was a mighty fine piece of machinery in its day, but years of experience transformed it into a complete, modern efficient floor mopping outfit. This is Geerpres' contribution to modern building maintenance.

Catalog 958 details the entire Geerpres line. Ask for it without obligation.

Geerpres

WRINGER, INC.

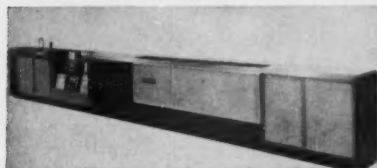
P.O. BOX 658, MUSKEGON, MICHIGAN

American Assoc. of School
Administrators
Atlantic City Auditorium
Feb. 13-17
Booth D-67

TO HELP YOU get more information quickly on the new products described in this section, we have provided the convenient Readers Service Form on page 227. Check the numbers on the card which correspond with the numbers at the close of each descriptive item in which you are interested. The NATION'S SCHOOLS will send your requests to the manufacturers. If you wish other product information, just write us and we shall make every effort to supply it.

Restyled Classroom Ventilators for Year-Round Air Conditioning

The Herman Nelson School Air Systems Division of American Air Filter announces the restyling of its complete line of classroom unit ventilators for heating, ventilating and year-round air conditioning. The line is designed to meet the need in schools for more economy through more functional use of space. The new line includes a wide



range of colors for proper visual environment, functional equipment to meet the needs of overcrowded schools, and equipment which will provide proper air conditioning for all seasons of the year. The unit ventilator design is keyed to simple rectangular shapes conforming to the functional planes prominent in modern school architecture. All floor-model ventilators have one-piece, die-cast discharge grilles, anodized aluminum trim metal and snap-on front access panels. Classroom models are available in six decorator colors: flame, blue, green, salmon, gray and yellow, and color panels can be easily removed and changed to conform to changes in classroom color schemes, including mix-matching of colors. Models in the line include units for hot water, steam, direct-fired gas and electric systems. American Air Filter Co., 217 Central Ave., Louisville 8, Ky.

For more details circle #834 on mailing card.

Cram Celestial Globe for Science and Mathematics



A 12-inch Celestial or Star Globe is now available in the Cram Universal Globe line. Mounted in the Cram "Horizon Ring," equipped with several scales, the globe is designed to facilitate the study and teaching of astronomy and mathematics. It is printed in a deep blue shade with stars and constellations in contrasting white and silver. The George F. Cram Co., Inc., 730 E. Washington St., Indianapolis 7, Ind.

For more details circle #835 on mailing card.

Two Soups Added to Campbell Line

Available in both individual and quantity preparation sizes, two new soups are introduced by Campbell. Old-Fashioned Tomato Rice and Cream of Vegetable bring to 18 the number of soups in the ready-to-serve line for institutional use. They may be used with the Campbell counter kitchen, in coin or manually-operated dispensing equipment and for regular service. Campbell Soup Co., 375 Memorial Ave., Camden, N.J.

For more details circle #836 on mailing card.

Giant Demonstration Slide Rule Offered to Qualifying Educators

A giant Demonstration Slide Rule, available in three models, is being offered to qualifying secondary school educators. Also available is a set of Instruction Manuals and a course outline, offering a full range of teaching aids and professional literature to be used in conjunction with the Demonstration Rule. The expert slide rule instruction manuals were written by

WHAT'S NEW for Schools

Professor Maurice L. Hartung of the University of Chicago. The oversize slide rules are valuable aids in demonstrating problems to college classes, and serve a dual purpose in high schools by demonstrating problems and teaching the basics of slide rule technic. Each model is a complete and



detailed king-size duplicate of a 10-inch all-metal Pickett slide rule, made to exact scale. It is easy to read and manipulate and its large size and Eye-Saver yellow color make it effective for demonstration. Pickett & Eckel, Inc., 1109 S. Fremont Ave., Alhambra, Calif.

For more details circle #837 on mailing card.

Quality / FURNITURE for all SCIENCE LABORATORIES

ALL SCIENCE
STUDENT'S TABLE

CATALOG NO.
A-1360-EC



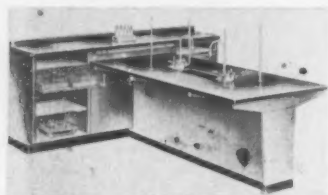
These new perimeter type tables offer unlimited design possibilities and arrangements from standard interchangeable base units. They provide numerous advantages for new construction design as well as for use in remodeling for Chemistry, Physics, Biology and General Science laboratories. Our representative engineer will be pleased to discuss your requirements and show you the entire line of Peterson furniture that has been the choice of leading educators and industrial furniture users for more than 65 years.

Write Dept. 1226 for Brochure Number 12. It's Free.

LEONARD PETERSON & CO., INC.
1222 FULLERTON AVENUE, CHICAGO 14, ILLINOIS

Student Laboratory Tables for Semimicro Chemistry

A new line of student laboratory tables designed especially for teaching Semimicro Chemistry is announced by Kewaunee.



Provided with a drop front compartment for storage of the 107-bottle reagent trays, the tables can have either individual

locked student drawers for storage, or open compartments for tote trays. The Perimeter type table shown in the illustration permits four students to work sitting down and shows the open compartments for tote tray storage. In addition, tables are available in several designs for two, four, six and 12 students. Kewaunee Mfg. Co., 5028 S. Center St., Adrian, Mich.

For more details circle #838 on mailing card.

Homemaking Room Cabinets in Kitchen Maid Wood Line

An attractive and complete line of homemaking cabinets is now available from the Kitchen Maid Corporation. Manufacturers of quality wood cabinets, the company presents a modified version of domestic

kitchen cabinets but much more ruggedly built at every point of stress to stand up in school use. The modern styling, attractive appearance and warm wood paneling texture give a home-like appearance to the classrooms. Features of the line include quiet, smooth-sliding, maintenance-free aluminum drawers; Loksafe adjustable shelving; sliding tray base units; rotating shelves, and a wide selection of wood finishing or attractive enamel colors. Structural features ensure long life, and the line



includes several styles of cabinets and tables to fit every homemaking classroom need. Kitchen Maid Corp., Andrews, Ind.

For more details circle #839 on mailing card.

LUXOUT® DIM OUT or Black Out DRAPERIES

... offer your best choice of effective light control

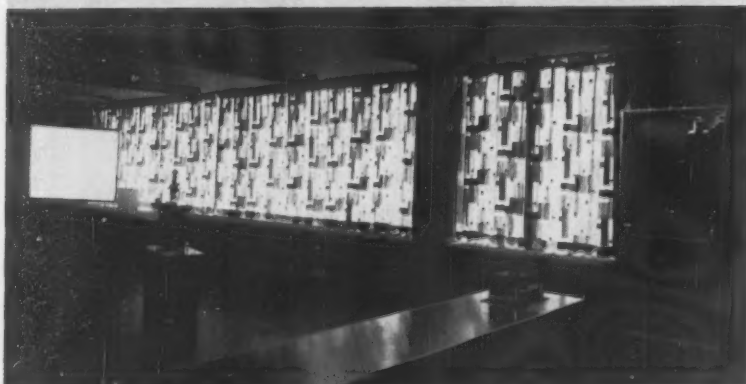


Photo above illustrates LuXout's Exclusive NASSAU DIM OUT Draperies

Classroom audio visual light control requirements differ according to circumstances. Many prefer total BLACK OUT light control; however, since LuXout led the way with DIM OUT light control draperies, many architects and engineers have indicated a preference for better student rapport through the use of LuXout DIM OUT draperies. LuXout offers both types to fulfill all light control classroom TV or audio-visual projection needs.

Write for Free brochure and color samples.

See our exhibit at the AASA Convention—Booths L1 and 2, February 13-17.

Free Light control quality evaluation guides will be available.

Plastic Products
INCORPORATED

Department SM
1822 East Franklin St.
Richmond 23, Virginia

Automatic Feeding Mechanism in Ditto Duplicators

"Sure-Feed" is a new automatic feeding system developed for Ditto duplicating equipment. It employs specially designed fingers in place of rubber side pads to ensure trouble-free automatic feeding. Sure-Feed improves feeding of post cards and inferior grades of paper, and permits positive automatic feed of punched or round corner stock. It is now standard on Ditto models D20, D30, D31, and D35 and can also be added to many late model machines. Ditto, Incorporated, 6800 N. McCormick Blvd., Chicago 45.

For more details circle #840 on mailing card.

Traffic Signal System for Mid-Block Crossings



Designed for operation at mid-block crossings, the new Type PA-30 School Traffic Signal System has the exclusive Crouse-Hinds electronic controller for simple timing adjustments. Control knobs are easily turned to desired settings for automatic operation during the morning and afternoon with the normal highway "Go" indication for non-school days and hours. Crouse-Hinds Co., Syracuse 1, N.Y.

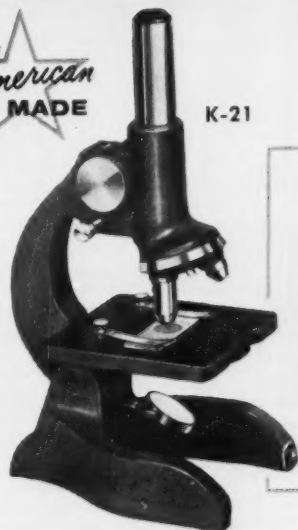
For more details circle #841 on mailing card.

(Continued on page 180)

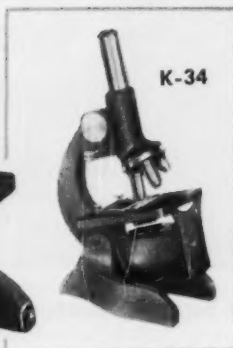


TESTA MICROSCOPES are designed and priced to provide the greatest number of quality instruments for a given budget!

American
MADE



K-21



K-34

For High School and College

Testa "Model K" Microscopes have many special features usually found only on much more expensive research instruments. 12x Huygenian eyepiece. Color-coded parfocal objectives. Extremely precise fine focus. Helical rack and pinion. Automatic adjustable safety stop. Large professional 90° tilting stand with bumper toes to protect stage and objectives.

MODEL K-21. Double revolving nosepiece. 10x and 45x parfocal color-coded objectives. 120x to 700x magnification. 6-aperture diaphragm disc. **\$9450**

MODEL K-34. Triple revolving nosepiece. 10x, 18x, and 45x parfocal color-coded objectives. 120x to 700x magnification. Includes illuminator, condenser, and iris diaphragm. **\$11600**

FOR NATURE STUDY

Study live insects and whole specimens with **WIDE-FIELD MODEL A**
No slides to prepare!

... with this rugged, full-size microscope. Features large working distance and 15x, 45x, and 75x magnification. Unusual versatility. 360° inclinable arm. Kellner-type eyepiece. Triple divisible objective. Large reversible black and white stage.



\$5485

For Elementary and Junior High School

Start their interest in Science early
... with the **TESTA S-3**

This sturdy, full-size instrument is ideal for beginners. It is equipped with the basic components of standard compound microscopes. 10x Huygenian eyepiece. 75x to 250x magnification. Double divisible color-coded objectives.



\$3985

TESTA G-4...
ideal for
elementary
biology

Standard-size compound microscope provides variable

magnification from 100x to 400x. Makes teaching easier... students learn faster. Triple divisible color-coded objectives. 6-aperture diaphragm disc. 12x Huygenian eyepiece.



\$6450

Quantity Discounts to Schools

T Write for Catalog on complete line
TESTA MFG. COMPANY
Dept. NS—10126 East Rush Street—El Monte, California



Fast, Big Volume Wet Pick-up from All Floors



Saves labor ... Saves time ... Does it better, faster.

Where recovery of water, suds, any liquid from floors is the job, here are two simple solutions to the problem.

1. Purchase a Super Model BP-2 or Model RS-1 heavy duty suction cleaner and the new Super Squee-Zee 30 attachment designed to fit both Super Models, or

2. If you already own a Super Model BP-2 or RS-1, as many do, simply buy the low priced Squee-Zee 30 attachment.

Either way you really get two units for the price of one—a Super cleaner and a big volume wet pick-up machine.



Super Squee-Zee 30 consists of a 30" neoprene rubber blade mounted in a metal frame, a suction chamber, 1½" hose, an adjustable handle and two metal plates by which the Squee-Zee 30 is attached to the transport handle of the cleaner.

The wide, capacious suction chamber avoids the small orifice bottle-neck and gives faster, drier pick-up—takes up water as fast as the operator can walk.

The adjustable handle permits easy use by any operator tall or short. The rear mounting avoids wheel marks and permits the operator to use the pressure necessary for low places in the floor. The unit can be attached and detached without tools—hands only—in minutes. Write for catalog and data, or ask your local Super distributor.



"Once Over Does It"
SUPER SERVICE®
Power Suction Cleaners • Quality Floor Machines
SINCE 1911

"THE DRAFT HORSE OF POWER CLEANING MACHINES"

THE NATIONAL SUPER SERVICE COMPANY

1956 N. 13th St., Toledo 2, Ohio

Junior Model No. 6501

Is Low-Priced Science Table

Designed for use in schools not equipped with permanent laboratory facilities, the new Junior Model #6501 portable science table is priced for even the smallest elementary school science budget. It is a completely self-contained unit mounted on large, heavy duty casters, two of which lock for stability during science demonstra-



tions. It is readily moved to any location, and is fully equipped to provide water, gas and electrical facilities. Generous locked storage space is provided in the cabinet and the 48 by 30-inch Fibersin top has a Melamine plastic surface that resists wear, scratches, dents, heat and chemical stains. **Grade-Aid Corporation, 46 Bridge St., Nashua, N.H.**

For more details circle #842 on mailing card.

Fire Retardant and Germicide in Masslinn Cleaning Cloths

Developed for use with the Masslinn Sweeping Tool, the semi-disposable Masslinn Cleaning Cloths for dry dusting of floors and walls now contain a fire retardant and a germicide. The non-woven flannel-like material absorbs and retains dust and dirt without oiling, dampening or chemical sprays. It is inexpensive enough to be discarded after long use, does not put dust into the air, and now improves sanitation due to the addition of the germicide. **Chicopee Mills, Inc., Non-Woven Fabrics Div., 47 Worth St., New York 13.**

For more details circle #843 on mailing card.

Low-Priced Dish Truck for Fast, Efficient Service



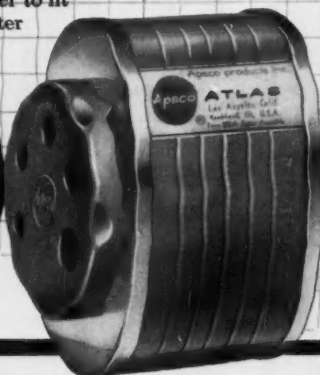
Fast and efficient handling of dishes is effected with the new Colson low-priced dish truck. The three 18 by 22-inch stainless steel beveled shelves are free of crevices and the chromium plated tubular frame is easy to maintain. The truck is designed for maximum maneuverability and rolls on four swivel casters. **The Colson Corp., 7 S. Dearborn St., Chicago 3.**

For more details circle #844 on mailing card.

(Continued on page 184)

5,000 Schools Designed and Priced this Sharpener!

Over 5,000 schools throughout the country were queried on the features they needed in a single bearing, heavy duty, general-purpose pencil sharpener. Apsco designed the sharpener to fit those needs and built it better than requirements dictated.

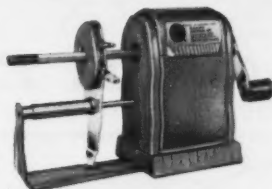


Apsco pencil sharpeners are endorsed by school custodians because their heavy-duty design and highest-quality manufacture ensure reduced servicing and repairs, and give schools the best in long range value.



THE "ATLAS" WITH THE EXCLUSIVE "ALL STEEL" WELDED FRAME - Budget-priced pencil sharpener.

THE "DANDY" & "DEXTER"—Top machines exclusive with Apsco.



For schools interested in buying pencil sharpeners with that "extra long life" quality, Apsco offers the "DEXTER" and "DANDY" All Steel Double Bearing models, approved and accepted by school systems throughout the country. Only Apsco produces heavy duty, welded steel frame models. You know that with an Apsco pencil sharpener, you are getting the best for a "lifetime" of hard work.

HERE'S HOW THE QUALITY APSCO DEXTER SAVES YOU BIG MONEY!

	The Dexter	INITIAL COST	
	Others	INITIAL COST	
Other sharpeners sell for less than the Apsco Dexter, BUT...			
	The Dexter	LIFE SPAN	
	Others	LIFE SPAN	
the Dexter lasts much longer, SO...			
	The Dexter	YEARLY COST	
	Others	YEARLY COST	
the Apsco Dexter provides unequalled economy... in every respect.			

Other popular priced Apsco pencil sharpeners which have won approval and acceptance in the Nation's schools.



PREMIER—finest portable sharpener with heavy-duty cutterhead.



GIANT—universally accepted, general purpose model.



CHICAGO—Economy model, sharpens only standard size pencils.

EXCLUSIVE FEATURES:

- The ATLAS is the *only* all-steel frame, single-bearing sharpener on the market.
- The ATLAS is the *only* single-bearing sharpener with completely replaceable ring gear and bearing assembly.
- The ATLAS features a large capacity receptacle with positive action dial-selector.
- The ATLAS sharpens all popular-sized wood-cased pencils and features a positive point-stop to prevent pencil waste.
- The ATLAS utilizes Apsco's popular type 3A cutterhead assemblies designed to provide maximum service.

Apsco

Send for the NEW
FREE Apsco Catalog!

APSCO PRODUCTS, INC. Mailing Address P.O. Box 840,
Beverly Hills, California 15-2

NAME _____

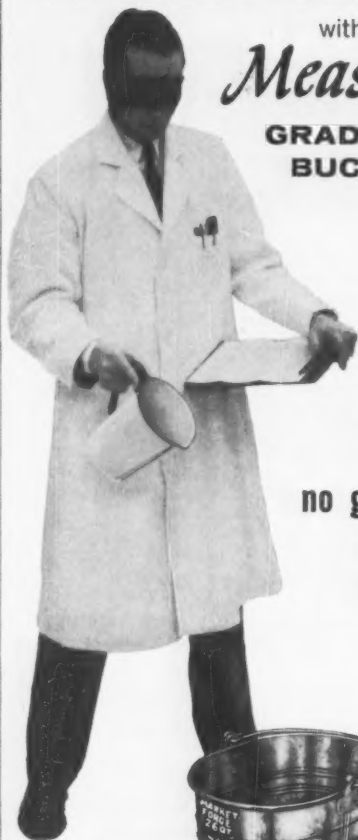
ADDRESS _____

CITY _____

You Can Almost Work
BLINDFOLDED

with NEW
Measurite T.M.

**GRADUATED
BUCKETS**



**no guesswork!
no waste!
scientific!**



**Embossed
gallon graduations
saves you time . . .
Saves chemicals . . . Gives you cleaner
floors with less effort**

Now — a completely new and exclusive concept — the greatest advance in bucket design in the last 25 years! *Measurite* BUCKET with embossed, easy-to-see gallon graduations is a real money and labor saver because it guarantees accurately MEASURED cleaning solutions. It cuts down on time spent on the job, makes clean floors a certainty. *Measurite* — the completely modern and scientifically designed bucket — is heavy gauge, oval or round in galvanized or stainless steel, with or without *Roll-Easy* Ball Bearing casters, 20 to 35 quart capacity and reinforced with deep corrugations and hand soldered seams. Here at last is the bucket you have been waiting for — *Measurite* — another step in Market Forge's program to give you better floor cleaning equipment for better cleaning.



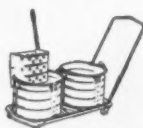
SQUEEZE-EASY
the only squirt-proof
mop wringer with a
20-1 leverage ratio
with double action
downward lateral
motion that takes
all mops from 12
through 32 ounces.

Write Dept. NS-2



MARKET FORGE

Everett 49, Mass.



DO-ALL
Mopping Sets —
featuring the only
bucket truck adjust-
able for any size
round or oval buck-
ets with U-shaped
handle and ball-
bearing casters.

a
complete
line

"The Quality Kind"
of Library Furniture

SEE . . .
our display
at A.A.S.A. Show
Feb. 13-17, Incl.
Spaces 1041-
1043

A few
distributorships
available



Utility, Display and Space Economy are all incorporated into this 60 and 82 inch high Newspaper and Magazine Shelving . . . by Buckstaff.

Now, with the dignity, durability, and lasting beauty of hard maple — Buckstaff has created a *Complete Line of Library Furniture* that includes shelving, reading tables, charging desks, cabinets, yes — and even library lounge and office furniture.

Flexible, for the smallest or largest library installations. Beautiful in either autumn or natural maple with matching Resilyte Mar-Proof Plastic, Wood Veneer or Linoleum tops. For literature on the complete line of Buckstaff Library, Cafeteria and Classroom furniture, contact your nearby Buckstaff Representative or write . . .

BUCKSTAFF COMPANY SINCE 1882
OSHKOSH, WISCONSIN

You say this Tergisyl®
disinfectant-detergent
cleans, deodorizes and disinfects
at the same time? Sounds like
just what we need for the halls
and classrooms as well as the gym
and lavatories—got to do everything
possible to check the spread
of disease germs this year.

If hospitals like it so well,
it should be just right for schools.
Know if it comes in large sizes?



Sure—even 50 gallon drums—
that's what we ordered—but it comes
in 15, 5, and even 1 gallon sizes, too.

That's right, we're getting Tergisyl®
for every school in the district.
Why don't you send for samples?
We did, and were convinced
on the first trial.

©L & F 1955



One 4 oz. sample makes 1 gallon
of cleaning-disinfecting solution.
Write for samples today.

Lehn & Fink Professional
PRODUCTS CORPORATION DIVISION
4934 LEWIS AVE., TOLEDO 12, OHIO
Makers of Lysol® Brand Disinfectant

★ ★ ★ ★ ★ Have you
applied for Your share of
FEDERAL NDEA MONEY?

Have you enriched your science courses? As you are aware, Federal support is available to you under Title III NDEA. Now you can equip your science department in the way you have always wanted.

Cenco representatives have made a study of the Title III program and are qualified to give details in your area—how you may apply for your share. Write us today—no obligation.

To assist you further, the Cenco conversion list provides numbers which correspond to items in the "Purchase Guide"*. Send for PG-1 and for our suggestive list of apparatus. Specify elementary science, earth science, physics, chemistry or biology.

*Prepared by the Council of Chief State School Officers



CENTRAL SCIENTIFIC CO.

A Subsidiary of Cenco Instruments Corporation
1716 Irving Park Road • Chicago 13, Ill.
Branches and Warehouses—Mountainside, N. J.
Boston • Birmingham • Santa Clara • Los Angeles • Tulsa
Houston • Toronto • Montreal • Vancouver • Ottawa

Serving education since 1889.

Student PROOF

yet
Instantly Adjustable!

PERFECT POSTURE—INSTANTLY!

- Standard School Colors
- Instantly Adjustable
- Tubular Design
- Sturdy Maple Seats

\$7.95

The one Dependable Guarantee... FOREVER!

DEPENDABLE MANUFACTURING CO.

2407 FORT CROOK ROAD, BELLEVUE, NEBRASKA

Here's inexpensive posture seating with all the adjustments of that used in business. The height adjusts instantaneously from 14" to 22"; the 5-ply maple seat pivots on a life-time swivel; the back adjusts in and out, up and down. Write today for full information. Prices on similar chairs start at

NOW WASH WINDOWS

HIGH or LOW FASTER AND SAFER

with a Tucker Window Washer



HOW TO OPERATE

Custodians all over the country have operated Tucker Window Washers without previous demonstration or observation. If your custodian wants to try a Tucker Window Washer, we will ship prepaid with the understanding that the washer may be returned for cancellation of the charges if not satisfied.

TUCKER WINDOW WASHERS Feature...

- **TELESCOPIC HANDLES**
Telescoping Aluminum Sections available for lengths up to 66 feet. Sections also come apart for use in other combinations. A 66 foot handle, brush and hose full of water weighs only 20 pounds.
- **AUTOMATIC, VISIBLE DETERGENT**
Valve controlled detergent dispenser makes and delivers detergent solution from compressed tablets... or clear rinse water as desired. Acrylic tube container shows contents at a glance.
- **COMPRESSED DETERGENT**
Compressed Detergent Tablets clean glass, but will not etch paint, stain stone or brickwork, nor injure grass and shrubs.
- **SPECIAL WINDOW BRUSHES**
Wide flare brushes with Nylon edges and Polyurethane foam centers wash windows, edges and corners in one swipe.

ONLY TUCKER WINDOW WASHERS can show you how to save time and money in cleaning your inaccessible windows. Up to now, it was necessary to erect costly scaffolding. With a Tucker window wand, it is a simple time and money-saving task to clean those windows... and by standing on terra firma. Tucker offers eleven model sizes for most buildings from one to five stories. Most popular size, Model 4, reaches modern 3 stories and older 2 or 2½ story schools. Costs only \$69.80 delivered for use without detergent or dispenser.

Available through your favorite Sanitary Supply Dealer... or write for full particulars, prices and measuring instructions to...

TUCKER MANUFACTURING CO.
CEDAR RAPIDS, IOWA

Low-Priced Change Sorter-Counter Is Readily Portable



Light weight and low price are features of the new fully automatic combination coin counter and sorter recently introduced by Standard Change-Makers. The electric machine operates automatically after setting the counter, flipping the switch and pouring in the coins which it counts speed-

ily and accurately. Sorting and counting operations are separate, providing an automatic check of the total. The precision-built machine weighs just 27 pounds and is readily carried to the place of need in its Hammerloid Brown finished sturdy carrying case. It operates on 110 volt alternating current. Standard Change-Makers, Inc., 422 E. New York St., Indianapolis 2, Ind.

For more details circle #845 on mailing card.

Mobile Science Cabinet for Classroom Demonstration

Designed for Fleetwood by Henry P. Glass Associates to facilitate science teaching in elementary classrooms, the new No. 1085 Science Cabinet is a mobile unit which can be moved from room to room.

The storage area, consisting of cabinet and drawer space, holds all necessary equipment. The laminated plastic top is chemical-resistant and large enough for teaching demonstrations. The unit is equipped with apparatus supports, hand operated pump with goose-neck faucet, swivel, electrical cord reel and dual outlet receptacle. It



moves easily on heavy duty casters with locking brakes. Fleetwood Furniture Co., Zeeland, Mich.

For more details circle #846 on mailing card.

Both NEW and DIFFERENT SHELDON 15" PRECISION LATHES



ER60P
5' bed—31" centers

NEW

New. Revolutionary double-box Headstock (Pat. Pend.)
New. "WORK-HOLDING ONLY" Spindle.
New. Single-Shift Back Gear Lever on Headstock.
New. Headstock and Apron running in oil.
New. 1½" Hole through Spindle.
New. 60-pitch Gear Box with built-in Lead Screw Reverse.
New. Amazing LOW PRICE.

DIFFERENT

Different. Spindle rigidly held in two large "Zero Precision tapered roller bearings arranged in box-type design.
Different. Electrical switches and push-button stations fully enclosed in built-in well in headstock.
Different. Two independent clutches in apron for selecting power feeds.
Different. Cam-action tailstock clamp for rapid release and instant locking of tailstock.
Different. Triple, cogged, V-belt outboard drive—eliminates intermediate shafts—delivers more power to spindle.

This is an all new lathe that bridges the gap between conventional belt driven and geared head lathes. It combines the capacity and power of a geared head with the economy and flexibility of a belt driven lathe. Available with 5', 6' and 8' bed lengths providing 31", 42" and 66" center distances.

Send in Coupon for full information

SHELDON MACHINE CO., INC. 4266 No. Knox Ave., Chicago 41, U.S.A.

Gentlemen: Please send me information on items checked.

- ☐ The NEW and DIFFERENT SHELDON 15" Lathes
- ☐ Sheldon ☐ 10", ☐ 11", ☐ 13" Lathes
- ☐ 11" and 13" Variable Speed Lathes
- ☐ High Speed Turret Lathes
- ☐ Sebastian 13" and 15" Geared Head Lathes
- ☐ Horizontal Milling Machine
- ☐ Sheldon 12" Shaper
- ☐ Name of Local Dealer
- ☐ Have Representative Call

Name Title
School Name
Street Address
City State

☐ Company
☐ Home

SHELDON MACHINE CO. INC. 4266 N. Knox Avenue
Chicago 41, Illinois

Mineral Fiber Formboard Has High Acoustical Absorption

A new mineral fiber formboard, faced on the room side with a sheet of durable plastic, is introduced as Pyrotone. It has high acoustical absorption and high light reflectance and forms an attractively finished ceiling when left exposed. When laid on sub-purlins spaced 32½ inches on centers, Pyrotone will support a two-inch poured gypsum roof deck with minimum deflection. United States Gypsum Co., 300 W. Adams St., Chicago 6.

For more details circle #847 on mailing card.

Fold-Away Device Provides Gymnasium Facilities

Stamm's Fold-A-Way Gym is a sturdy, simple, basic apparatus which provides fa-



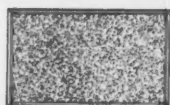
cilities for physical development. The design permits the user to employ the principle of leverage, allowing him to do as much or as little as he is able, thus adapting the device to the use of the top athlete or the smallest handicapped child. It can be used indoors or out, sets up or is taken down in seconds, and folds into a four by 42 by 84-inch unit for storage. Stamm's Gym is suitable for use on playgrounds, in gymnasiums, athletic departments or special training areas, for the handicapped and for other uses. Jarke Mfg. Co., 6333 W. Howard, Chicago 48.

For more details circle #848 on mailing card.
(Continued on page 186)

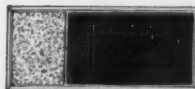
CUSTOM • BUILT to your instructional needs



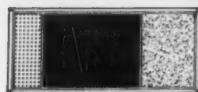
chalkboard only



corkboard only



combination unit

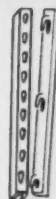


combination unit



with
**HANGING
STRIPS**

for raising and lower-
ing for different age
groups



SIMPLEX pre • fab units by BECKLEY • CARDY



hang them to suit
class height average

re-hang later as class
height average changes



wall hangers
furnished

The extreme versatility of Simplex units makes them a practical solution to diversified chalkboard and mounting problems. You can plan each unit according to your classroom area and teaching requirements. Just a simple sketch with dimensions and materials indicated is all we need.

Your units are built in our factory — exactly to your specifications—and delivered to you ready to hang and use. All materials used are of proven, durable quality.

Aluminum trims and chalk troughs are expertly fitted to give a modern, trim appearance.

PLAN THEM TO FIT YOUR WALL AREA:

with enough

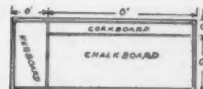
CHALKBOARD
(black or "litegreen")
for writing or drawing

with enough

CORKBOARD
(tan, green, gray)
for mounting

with enough

PEGBOARD
for object hanging



typical ordering sketch

write for complete information

BECKLEY/CARDY

1912 north narragansett ave. • chicago 39, ill.

serving the nation's
schools through dealers

THIS IS THE HEART OF



Pat. Nos.
2364191
2710048

AJUSTERITE CHAIRS and STOOLS



The patented adjusting mechanism illustrated above is the reason hundreds of thousands of Ajustrite Chairs and Stools are in service today—it is the oldest, the simplest, the fastest, the most trouble-free. A child can operate it. You merely lift the seat to the desired height. That's all. No bolts, no nuts, no screws. No tools.

AND NO SOILED HANDS

That's especially important for typing and drafting students. No dirty wheels or knobs or tools to handle. Just lifting the seat to the desired height does the trick.

Ajustrite Chairs and Stools have been doing valiant duty since 1934. They are particularly popular in college and school classrooms, laboratories and vocational training shops. Seats and backrests are adjustable to fit any size student—short, tall or medium—slender, heavy or average—and at the same time to provide healthful posture. May we send you descriptive literature?

FREE TRIAL Use an AJUSTERITE chair or stool for 30 days without obligation. Prove to yourself the many advantages AJUSTERITE offers in comfort, utility and economy. Write today—we'll do the rest.

10 YEAR GUARANTEE: The Ajustrite adjusting mechanism actually compensates for its own wear—will last and last and last. That's why we can give a 10 year guarantee.

SEE US IN

Booth No. 1344
AASA SHOW
February 13-17
Convention Hall
Atlantic City



CLASSROOM



LABORATORY



VOCATIONAL SHOP

AJUSTO EQUIPMENT CO.
515 CONNEAUT ST. BOWLING GREEN, OHIO

Language Laboratory Tape Recorder Is Tamperproof and Easily Operated

Easy operation and an almost foolproof means of tape recording in the classroom are provided with the Simplex Model LP 902 tape deck. The deck is fully enclosed, preventing tampering, and the tape cannot be removed by the student. The only two controls visible to the student are the Play-Record lever and the Rewind lever



and the recorder has a transistorized signaling device which warns the student when the end of the tape approaches. Rheem Califone Corp., 1020 N. La Brea Ave., Hollywood 38, Calif.

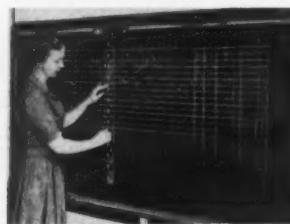
For more details circle #849 on mailing card.

Sanitizing Dustchek Type "E" Treats Dusters in Wash-Wheel

A scientifically formulated, water soluble emulsion containing an integrated bactericide effective against staph and other organisms is available in Sanitizing Dustchek. The new Dustchek dip treatment Type "E" permits treatment of dust mops and cloths in the wash-wheel immediately after the washing cycle. Dusting equipment can thus be treated in bulk to keep bacteria from multiplying. The new Dustchek formulation is drawn completely from the water solution into the cloths, avoiding waste and assuring properly treated dusting equipment. Franklin Research, 5134 Lancaster Ave., Philadelphia 31, Pa.

For more details circle #850 on mailing card.

L & L T-Rule for Chalkboard Use

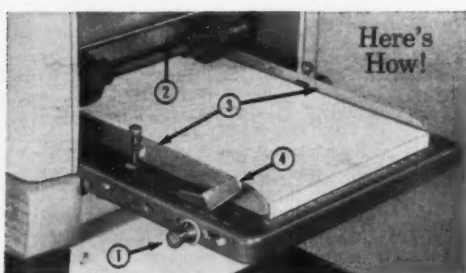


A new teaching aid called the L & L T-Rule facilitates drawings at the chalkboard. It permits the use of ruled forms, graphs, mechanical and geometric drawings, music staves and similar material on the chalkboard with accuracy and ease. Resembling a T-square mounted in a track, the device moves across the chalkboard surface and is adjustable to any angle. Material requiring rules can be drawn in minimum time, with accuracy, to produce visual aids in shop, mathematics, music and other classes. L & L T-Rule Sales, Inc., 5515 Excelsior Blvd., Minneapolis 16, Minn.

For more details circle #851 on mailing card.
(Continued on page 188)



Easy as A-B-C-Ditto.



NEW DITTO SURE-FEED SYSTEM GIVES NEAR-PERFECT DUPLICATION EVERY TIME! (1) New Feed Pressure Lever adjusts to every weight stock. (2) New Separators feed only one sheet at a time. (3) New positive-locking Side Guides prevent skip feeding. (4) New Lift Lever permits easy paper insertion.

Ditto.
The helping hand for half a century

A DITTO Direct Process (spirit) duplicator enables even students to turn out masterful, professional looking jobs. It's as easy as A-B-C: A—type, write or draw your copy on a DITTO master. B—attach it to the drum using DITTO's quick-'n-easy master attachment. C—flick the switch or spin the perfectly balanced hand control. A minute later 120 crisp, photographically accurate copies are at your disposal at less than 1/10¢ each. DITTO is perfect for preparing exams, progress reports, school bulletins. It duplicates up to 5 colors at a time, on any weight paper from 16 pound to cardstock, any size from 3x5-inch to 9x14-inch. There's a DITTO Direct Process (spirit) duplicator to fit your needs, and your budget. Call the DITTO branch or dealer nearest you today for a free demonstration—or mail the coupon.

DITTO, INC.—3304 PRATT AVE.—CHICAGO 45, ILLINOIS

- ☐ Send additional information on DITTO School Duplicators
☐ Arrange a DITTO demonstration at my school

Name, Title _____
Name of School _____
Address _____
City _____ County _____ State _____

Fold-A-Booth Language Lab Converts for Other Uses



Classrooms equipped with the Fold-A-Booth language laboratory units can be converted for regular studies by folding the lid over the flush-mounted recording equipment to form a desk. It is designed

for all educational levels and offers all the advantages of maximum acoustic separation with maximum visibility. The unified laboratory-classroom unit permits language students to work at a pace suited to individual abilities and with recorded lessons the teacher can give individual attention. **Magnetic Recording Industries, Ltd., 126 Fifth Ave., New York 11.**

For more details circle #852 on mailing card.

Staph-Trole Antiseptic-Cleaner Is Non-Ionic Detergent

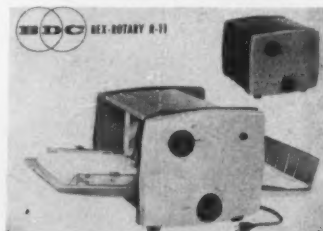
A new germicidal agent is combined with a special non-ionic detergent to form Staph-Trole, a new antiseptic-cleaner. The wetting and penetrating action of the detergent is such as to increase

the efficiency of the germicidal ingredients, according to the report. Staph-Trole cleaned surfaces resist re-contamination and stay odor-free for long periods. The completely non-ionic cleaner picks up both positively and negatively charged dirt particles, leaves no film residue, and washes in hard or soft, cold or hot water. **Multi-Clean Products, Inc., 2277 Ford Pkwy., St. Paul 16, Minn.**

For more details circle #853 on mailing card.

Self-Contained Spirit Duplicator Introduced by Bohn

The Rex-Rotary R-11 spirit duplicator is so designed that the feed and receiving



trays fold around it to form an attractive, dustproof case, the unit occupying less space than a typewriter. A new wick prevents flooding, the master clamp is automatic, and one control separates all rollers and shuts off fluid supply. The R-11 is available in electric and hand-operated models. **Bohn Duplicator Co., 444 Park Ave., New York 16.**

For more details circle #854 on mailing card.



*Blooming Prairie Jr.-Sr. High School, Blooming Prairie, Minn.
Arch: Haastick, Lundgren & Assoc., Inc., St. Paul, Minn.
Photographer: Clark Dean, Infinity, Inc., Minneapolis, Minn.*

SLATE CHALKBOARDS

first choice in leading schools
FOR EASIEST READING . . . WRITING . . . CLEANING



The growing number of award winning schools using slate chalkboards confirms slate's

- ... superior visibility
- ... unsurpassed writing and erasing qualities
- ... timeless good looks
- ... lowest cost per year
- ... simple maintenance

Write for free literature on slate chalkboards. You'll find them invaluable in choosing the proper chalkboard for your school.

500 million years in the making NATURAL SLATE

PENNSYLVANIA SLATE PRODUCERS GUILD, INC.
Pen Argyl, Pennsylvania

Sponsored by producers of Pyramid and Keystone American natural slate chalkboards



Porcelain Enamel Steel Panels in Sculpturama Embossed Designs

Sculpturama is the name given to the new line of embossed architectural porcelain enamel steel panels recently introduced. The panels offer an extensive range of design possibilities with the different surface planes available in a variety of colors. Sculpturama panels are available in an overall size of 40 by 40 inches with the embossed shape in the panel measuring approximately 34 by 36 inches. **Davidson Enamel Products, Inc., 1104 E. Kibby St., Lima, Ohio.**

For more details circle #855 on mailing card.

Economy Tote Tray Of High Impact Styrene

Falconite, a new fortified high impact styrene plastic material, is used to form the new Economy Tote Tray for home economics, shop and other school storage utilization. The low-priced unit is designed to withstand hard usage and is available



in five sizes. Stock colors, selected by a school color expert, include pastel shades of tan, pink, yellow and blue. **General Plastics Corp., 2040 Broadway, Santa Monica, Calif.**

For more details circle #856 on mailing card.

Laboratory Table Lock Protects Scientific Equipment

Designed to protect school laboratory equipment, especially after regular school hours, the new Yale and Towne laboratory drawer lock has pin tumbler cylinder mechanisms with a high degree of security. With the cost of scientific equipment, the new lock protects against pilfering when classrooms or other areas are used for special events, and against burglary or vandalism. The pin tumbler cylinder mechanisms in the new Yale drawer locks have not been used generally for desk, drawer and cabinet locks in the past and provide maximum

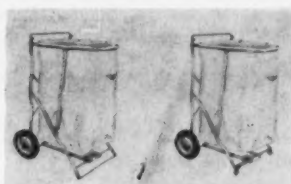


protection. The new lock is functionally square in shape to complement the contemporary design of new school equipment. The Yale & Towne Mfg. Co., 11 S. Broadway, White Plains, N.Y.

For more details circle #857 on mailing card.

Collector Carts in Lightweight Aluminum

Lightweight aluminum construction is now used in two Young collector carts. These maintenance units are rustproof and sanitary, suited for waste handling in kitchens, cafeterias and similar areas, and are



easy to handle due to reduced weight. The "Senior" cart tilts back to roll on two 10-inch diameter rubber-tired wheels. The "Master" has two front steering casters and two rear wheels for easy mobility without tilting. Carts are available with a choice of several canvas bag styles and sizes, are quiet in operation, and can easily travel on stairways. The Paul O. Young Co., Line Lexington, Pa.

For more details circle #858 on mailing card.



Universal Vise for Shop Teaching

The Wilton Universal Turret Vise is a new teaching tool designed for general

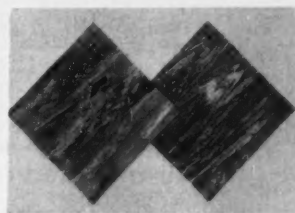
school shop use. More subjects may be taught in the same shop since the new vise will serve for woodworking and metalworking as well as for arts and crafts. In addition to the features of a woodworkers vise and a metalworking vise, the new unit is equipped with the Wilton patented Rapid Titan Nut for quick and easy opening and closing. Wilton Tool Mfg. Co., Inc., Schiller Park, Ill.

For more details circle #859 on mailing card.

Asbestos Tile Available in Wood Tones

Vina-Lux asbestos tile is available in either English Oak or French Walnut wood tones. The wood grain pattern, which extends through the thickness of the tile,

gives a random effect, since no two tiles are alike. The wood tone patterns come in standard nine by nine-inch tiles, one-six-



teenth of an inch thick. Uvalde Rock Asphalt Co., Azrock Products Div., Box 531, San Antonio, Texas.

For more details circle #860 on mailing card.

(Continued on page 190)

MODERN SCHOOLS CHOOSE

Mitchell
FOLD-O-LEG



PorTables



Doublers UniTables



For
Versatility
Durability
Economy

Students-Teachers and Supervisors, Administrators and School Boards, all prefer Mitchell multi-purpose equipment . . . each in their own way. Students like the accessibility, beauty, and comfort of the PorTables, Doublers, and UniTables. Teachers and Supervisors want the safety, speed and easy operation, practicality and mobility found in these units. Administrators and School Boards rightfully regard long-range utility, reduction of replacement costs, and the standardization offered in this complete line, as primary considerations. All of these advantages, and more, have long been accepted from coast to coast, as Mitchell standards of guaranteed quality. You'll find that Mitchell will meet your needs the best.



MITCHELL MANUFACTURING CO.

2734 South 34th Street
Milwaukee 46, Wis.

☐ Please send me literature on.....

☐ Please send me the name of nearest representative.

Name.....Title.....

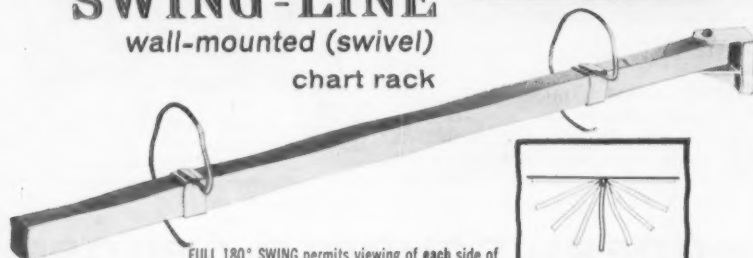
Address.....

City.....Zone.....State.....

double visibility
with the NEW

SWING-LINE

wall-mounted (swivel)
chart rack



FULL 180° SWING permits viewing of each side of each chart without turning chart.

ADJUSTABLE RINGS slide along arm to accommodate charts of varying widths.

SWING-LINE WALL BRACKETS may be mounted on any wall, at any height. SWING-LINE slips into bracket and is ready for use.

COMPACT. Slide rings from chart arm and SWING-LINE can be stored in any paper drawer. 36" long. Weighs only 1 lb.

Complete chart rack with one bracket only \$8.50
Additional brackets 95¢ each



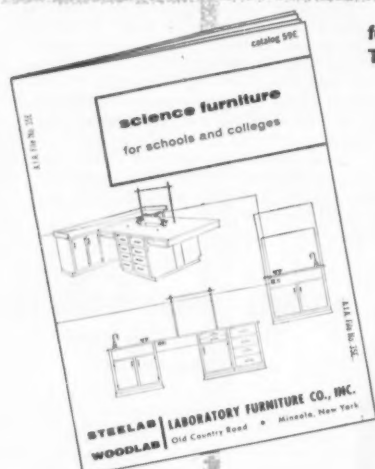
Another SHOWmanship teaching aid by

BILLERETT
company

513 So. Spadra Road, Fullerton, California

STEELAB
WOODLAB

NEW science furniture catalog and planning manual



for use by School Administrators, Science Teachers, Architects and Engineers

The most complete line of science furniture available from a single source—instructors' tables, student tables, auxiliary furniture, fume hoods, storage cabinets, top materials and service fixtures.

- hundreds of new units available in STEELAB or WOODLAB construction
- science room and laboratory layouts
- plumbing and electrical details
- fume hood and exhaust system data
- LABMASTER service fixtures

Write today for catalog 59E-N

first in steel
finest in wood

designed and manufactured by

LABORATORY FURNITURE CO., INC.

Old Country Road • Mineola, New York

Series 6000 Economy Chair Has Tubular Steel Legs

Durable welded construction, light weight and canted tubular steel legs fitted with swivel-type glides to protect walls are features of the Series 6000 economy chair.



It is available in seat heights of 11 to 18 inches and the design assures comfort and posture control. The Series 6000 is available in five colors with the finish resistant to water, acid and alkalis. **American Desk Mfg. Co., Temple, Texas.**

For more details circle #861 on mailing card.

Insulated Metal Curtain Walls Have High Fire Retardance

Five basic types of steel or aluminum faced exterior wall designs with fire retarding capabilities ranging over three hours are introduced by R. C. Mahon. The result of four years of combined research and field testing, the new firewall designs in lightweight materials are especially adaptable for elevator and air-conditioning penthouses, multi-story buildings and special projects such as exterior overhead walks or passageways in institutions. The wide range of shapes available will blend functionally with conventional insulated metal walls. The R. C. Mahon Co., Building Products Div., 6565 E. Eight Mile Rd., Detroit 34, Mich.

For more details circle #862 on mailing card.

Feather-Edged Vinyl Sealer Weatherstrips Doors



The "Seal-Draft" Weatherstripped Door Stop is a feather-edged vinyl sealer imbedded into the body channel and designed to flex with door operation to create a tight weatherproof seal. The body is permanently affixed to the wood or metal door jambs with stainless steel screws and can be used either as a weatherstripped door stop on straight jambs, or as a weatherstripping on rabbetted jambs. The product is packaged in set form with side bars coped to fit the header piece. Seal-Draft Div., Sun Screen Products, Inc., N. 2220 Division St., Spokane 21, Wash.

For more details circle #863 on mailing card.

(Continued on page 192)



for safety's sake ... use BRILLO® Floor Pads

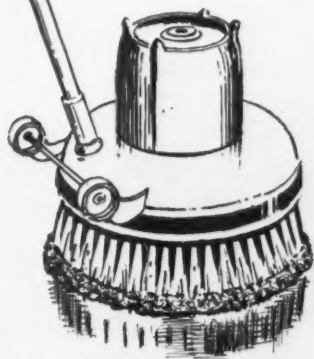
Beautiful, highly polished floors are safer floors. In fact, tests prove that a properly maintained waxed floor ranks high in safety. It is not the wax which causes slips and falls. It is faulty application or dirt on the waxed surface which makes the danger. A floor may be slippery if the wax is applied in too thick a coat ... the wax remains soft under the surface.

Keeping waxed floors safer, and sparkling too, is easy and economical with

Brillo Solid Disc Steel Wool Floor Pads. The wax should be applied in a *thin*, uniform coat ... then polished to a hard, safe finish with a Brillo Floor Pad. This hard surface resists grit penetration. Later, regular "once-overs" with a Brillo Floor Pad remove unsightly surface dirt, grime, and scuffs, and smooth out and reharden the wax. Your wax job takes on renewed beauty and longer life ... as well as being less hazardous.

Here are some helpful floor-safety and maintenance pointers:

1. Use a quality wax.
2. Apply wax in thin coats—two thin coats are far safer and better looking than one heavy coat.
3. Buff each coat to a high gloss with a Brillo Floor Pad.
4. Re-buff with Brillo Floor Pads regularly between waxings to renew finish. More effective than brushes!
5. Brillo Floor Pads strip off old wax quickly *without harm to the finest floor surface*. They last several times longer and cost less than other types of pads. Compare!



Because Brillo Floor Pads are cross stranded with uniform metal fibers compressed into a solid disc, you get superior cleaning and polishing action for every revolution of your machine. This cuts time—saves money.

There is a Brillo Floor Pad for each size of electric floor polishing machine, and grades from #0 to #3 for each task—stripping, scrubbing, applying wax, buffing.

Write today for your *free* leaflet on Better Floor Maintenance.



BRILLO SOLID DISC FLOOR PADS

BRILLO MFG. CO., INC., BROOKLYN 1, N.Y., MANUFACTURERS OF METAL WOOLS FOR OVER 45 YEARS

a
New

SCIENTIFIC AID IN TEACHING THE PRINCIPLE OF SOLAR ENERGY



THE STRONG SOLAR FURNACE

Under favorable atmospheric conditions, samples placed in the furnace can be subjected to temperatures in the vicinity of 2,000 degrees Fahrenheit.

Makes possible the utilization of the sun's energy in reaching the melting points of many basic elements.

Consists of a 14-inch parabolic mirror, a means of pivoting and tilting so that it is perpendicular to the sun's rays, a coarse and fine focusing device, and a sample holder, all mounted on a metal base.

\$69.50 F.O.B.
TOLEDO

Literature on request

Strong

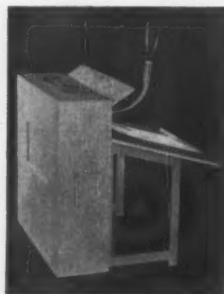
A
GENERAL
PRECISION
COMPANY

THE STRONG ELECTRIC CORPORATION

52 CITY PARK AVE. • TOLEDO 1, OHIO
A SUBSIDIARY OF GENERAL PRECISION EQUIPMENT CORPORATION

Courier Folding Sound Lectern Is Portable, Yet Roomy in Use

Compactness, light weight, portability and dependable performance are features



of the Courier Folding Sound Lectern introduced by Davisound. The microphone and reading lamp unfold out of the top compartment ready for use and the sturdy tip-proof desk top is clear for papers. The Courier can be used in auditoriums, gymnasiums and similar areas seating up to 1000. Optional accessories include a lapel microphone and a nylon fabric cover for transportation. Davisound, 106 Main St., Madison, N.J.

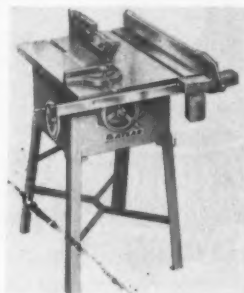
For more details circle #864 on mailing card.

Chalkboard Lighting Units Improve Visibility

Designed to improve visibility of chalkboard material, the new Solar Grad is a shadowless, glareless lighting unit for installation over the chalkboard or tackboard in a classroom. Made in four and eight-foot lengths with a fluorescent lamp properly positioned in a polished parabolic Alzak reflector of permanent finish, the fixture is ready for installation. It also accommodates "black light" fluorescent lamps for special visual demonstrations. Solar Light Mfg. Co., 1357 S. Jefferson St., Chicago 7.

For more details circle #865 on mailing card.

Atlas 10-Inch Bench Saw Features Safety and Accuracy

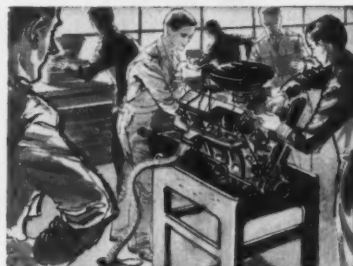


Years of dependable service are built into the new Atlas 10-inch Bench Saw. The heavy unit has features ensuring ease of operation, safety and long accuracy life. Both fence and mitre gauge are thick-walled aluminum castings designed to withstand abuse in school shops. Grill-type extensions can be added to the 20 by 27 1/2-inch work area for increased space. The new saw has all important features for efficiency and safety in operation. Atlas Press Co., 2076 N. Pitcher St., Kalamazoo, Mich.

For more details circle #866 on mailing card.

(Continued on page 194)

Keep Sickening Exhaust Gases Out Of Your School Shop



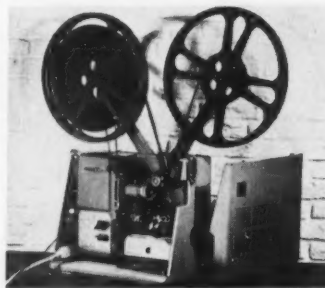
NATIONAL Systems remove poisonous carbon monoxide gas right at the source . . . the exhaust pipe . . . and carry it to the outside without heat loss in your shop. No rearrangement of your present shop layout necessary. Choice of 6 overhead or underfloor systems, which can be engineered to each individual application using standard "packaged" kits, including motor, blower, ducting, flexible tubing, etc., ready to install. Tell your architect or write for literature.

National SYSTEM
OF GARAGE VENTILATION, INC.

158 W. William Street Decatur, Illinois

QUIETEST

running 16mm sound
projector ever built



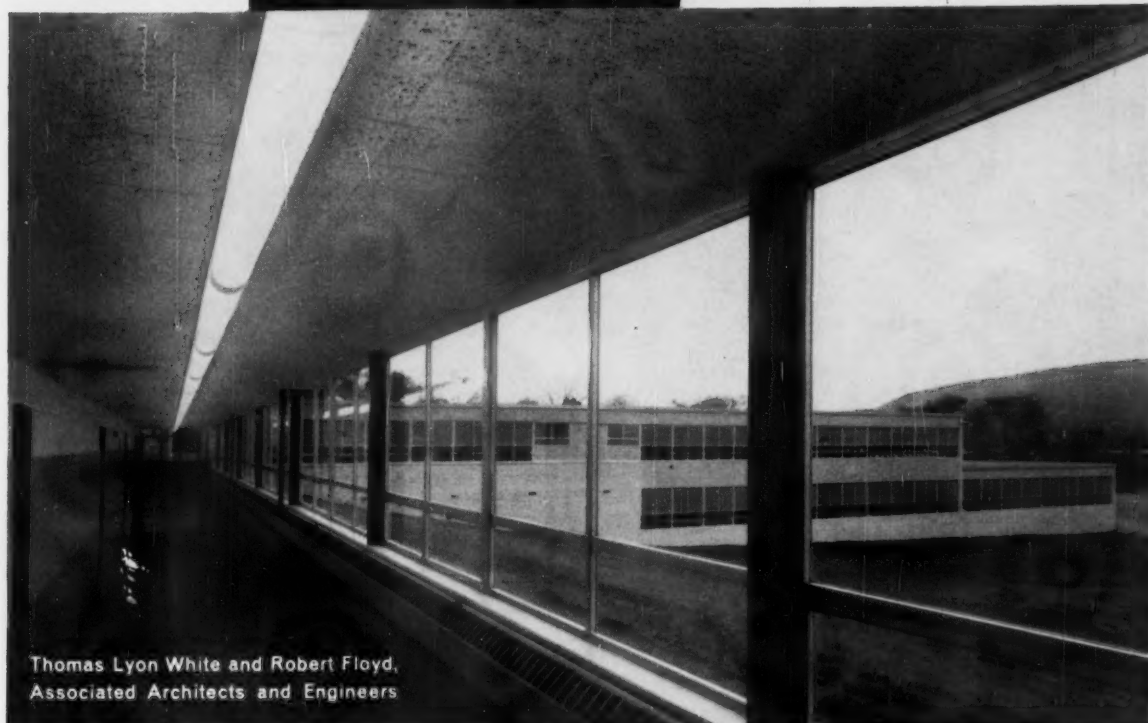
KALART VICTOR

FREE — Treasure Chest of Audio-Visual Ideas. Illustrated booklet tells how to use films most effectively. For your copy, circle #170 on mailing card, page 192.

Victor Animatograph Corp., Div. of Kalart
PLAINVILLE, CONNECTICUT



TRAVACOUSTIC TILES



Thomas Lyon White and Robert Floyd,
Associated Architects and Engineers

for a quality ceiling on a low budget

Designed under an austerity program, the split-level, 600 student, Tuscarora Elementary School near Addison, New York, cost only \$626,000—\$70,000 under the budget.

But there's nothing austere-looking about the finished job. For instance, the architect used Travacoustic, a mineral wool acoustical tile with all the fissured beauty of travertine stone, to add an elegant note to classrooms and corridors. Though Travacoustic might look extravagant in a low budget school, it's really a sensible investment. Here's why:

1. It's noncombustible.
2. It absorbs up to 85% of the noise that strikes it, making school more comfortable for children and teachers.
3. It's easily installed.
4. It can be repainted without loss of acoustical value.

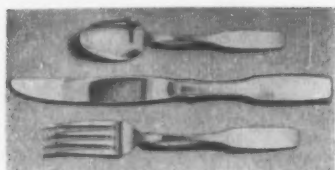
If you're planning to build, it'll pay you to look up your Gold Bond® Acoustical Contractor in the Yellow Pages. Or write Dept. NS-260 for free samples and literature.

NATIONAL GYPSUM COMPANY, BUFFALO 13, N.Y.



...a step ahead of tomorrow

Heavy Weight Silverplate Used in Bennington Pattern



Fine quality, extra heavy weight silverplate is used by Oneida in the new Bennington pattern of institutional silverware. The pattern, a contemporary version of the Early American fiddleback design, is suited for stamping and will harmonize with any decor. **Oneida Ltd., Oneida, N.Y.**

For more details circle #367 on mailing card.

"AL" Aircon Unit Utilizes Condenser Heat

The new McQuay "AL" Aircon is a blower type air-cooled condensing unit which utilizes rejected condenser heat for heating and ventilating. It is extremely flexible for indoor and outdoor use and can also be used for the secondary purpose of exhaust ventilation and/or heating and ventilating. Time and money are saved in installation, maintenance and operation. The compactly designed unit can be ceiling, platform or floor mounted in minimum space. Seven models are available in eight different unit arrangements with capacities from 10 to 50 tons. **McQuay, Inc., 1600 Broadway N.E., Minneapolis 13, Minn.**

For more details circle #368 on mailing card.

Automatic Paper Stitcher Is Mobile Unit

Designed to work in conjunction with the new Rotomatic and Gathermatic Collators, the new Thomas automatic paper stitcher is completely mobile. It can be integrated with and controlled by the Push Button Programmer of the Thomas Rotomatic for automatic collating and stitching of any sheet combination. Readily mobile on its sturdy casters, the stitcher can be moved to any place of use as a hand-feed stapler and the dual head gives a choice of one or two staples. The design permits



stitching along the top or the side of a set. **Thomas Collator Industries, Inc., 100 Church St., New York 7.**

For more details circle #369 on mailing card.



TURN-TOWLS are giving the most for the school towel service dollar!

These little girls are using the finest quality towel a school can buy — and it's costing the public just 22¢ per pupil per school year.

It's Mosinee towel quality — plus controlled dispensing — that does it. Many large city school systems that buy low quality towels on a bid basis cannot serve pupils at less than 30¢ each per year.

Write for name
of nearest
distributor



Time and Labor Saved With Glass Polish

A new product that needs only to be sprayed on and wiped off to provide fast, easy cleaning without streaks or smears for such surfaces as windows, mirrors, marble, chrome, tile and plastics is announced by O-Cedar. Called Glass Polish, it is supplied in one gallon containers with two empty six-ounce spray bottles for easy application. **O'Cedar Div. of American-Marietta Co., 2246 W. 49th St., Chicago 9.**

For more details circle #370 on mailing card.

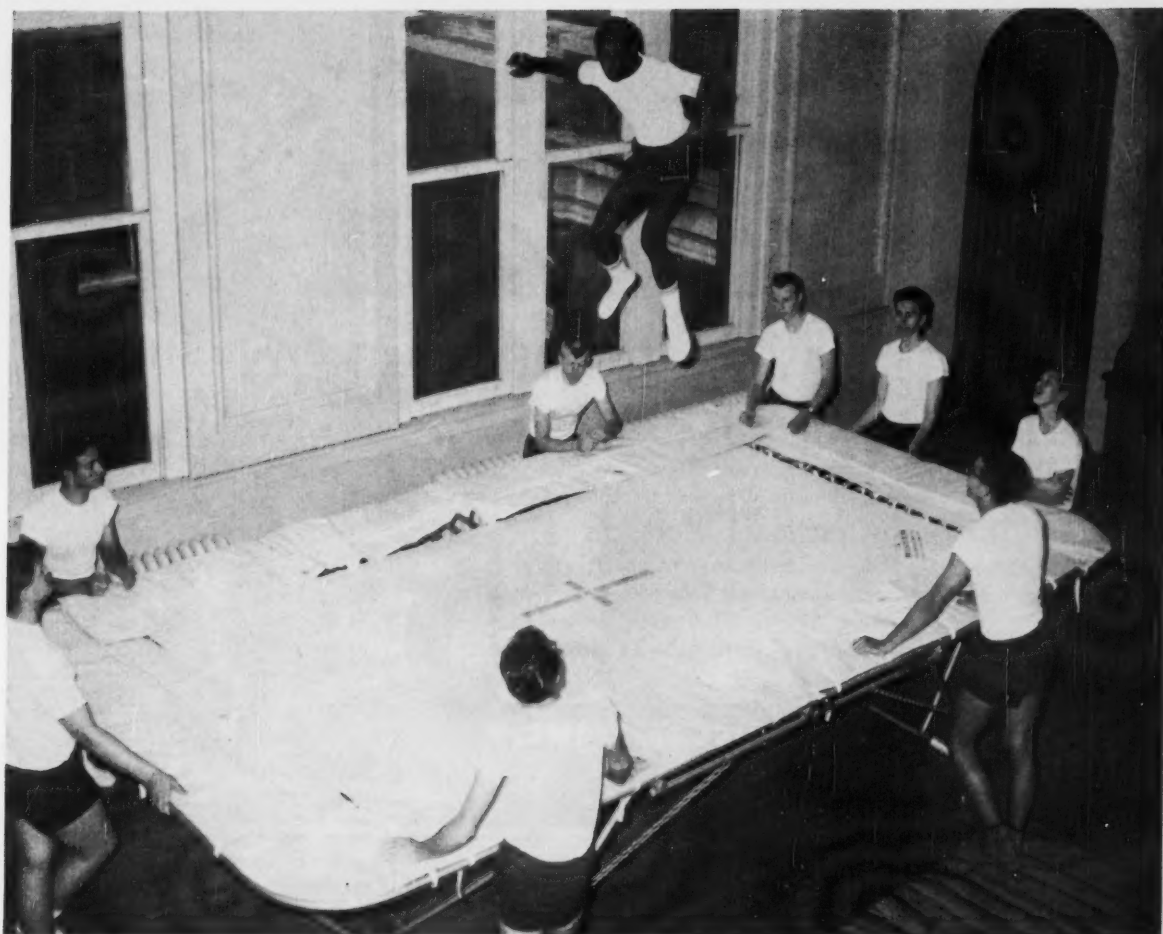
Line of Cooker-Mixer Kettles in Stainless Steel



Designed to speed volume preparation of foods while saving costs, the new line of "Cooker-Mixer" sanitary kettles is offered in stainless steel. Standard 40, 60, 80-gallon and larger capacities are available. The heavy duty Model DTA-2 steam-jacketed, agitator kettles permit clean, efficient and economical operation with savings in labor, preparation time and food waste. **Groen Mfg. Co., 1900 Pratt Blvd., Elk Grove Village, Ill.**

For more details circle #371 on mailing card.

(Continued on page 198)



126 Blind Students and a Trampoline*

Rebound-tumbling has proven to be a safe, thrilling and rewarding experience to the 126 blind students at the Washington State School for the Blind in Vancouver, Washington. "Since the purchase of our Nissen Trampoline 3 years ago, our attitude toward this type of equipment has certainly been changed," says Robert Mealey, physical education instructor. "It's brought new life and exhilarating enthusiasm to our entire physical education program."

A blind school, by most people, would not be considered an appropriate place to use our Trampolines. Actually, Washington State School

is only one of more than 10 blind schools and many more handicapped children's schools that safely use Nissen Trampolines to help in the physical development of their students. Although over 9,000 Nissen Trampolines have been sold to schools and colleges, we are especially proud of the ones used in these schools.

Send for your copy of an actual case history report on the program at Washington State School for the Blind and a copy of our latest booklet, "What You Should Know About Rebound-Tumbling." There is no charge — send for yours today.

*Reg. U.S. Pat. Off. for Nissen Rebound-Tumbling Equipment

NISSEN

NISSEN TRAMPOLINE CO.

Mfgs. of Rebound-Tumbling Equipment

215 A AVE. N.W. • CEDAR RAPIDS, IOWA

Phone EMpire 4-2417

NISSEN TRAMPOLINE COMPANY
215 A AVE. N.W., CEDAR RAPIDS, IOWA

Please send me a case history report on the program at Washington State School for the Blind and a copy of "What You Should Know About Rebound-Tumbling."

NAME POSITION
SCHOOL
ADDRESS
CITY STATE

INTRODUCING.....
an important new tool for
SCIENCE EDUCATION



the Poly-Ep PLASTICS EXPERIMENTAL KIT

Elementary and secondary school science classes can now give practical training in modern plastics chemistry. The Poly-Ep kit contains all the materials and apparatus for five laboratory experiments with epoxy resin plastics.

Safe, Simple Instructional Materials

Resins used in the experiments are completely safe and non-toxic. A well-illustrated 8-page booklet gives clear, concise instructions — discusses properties and uses of the better known plastics. Write for details.

A PRODUCT OF

DISTRIBUTED BY

D. J. PETERSON COMPANY

P. O. BOX 181
SHEBOYGAN, WISCONSIN

SCIENCE KIT INC.

BOX 69
TONAWANDA, N. Y.



Claridge Chalkboard & CORK Bulletins



Jefferson Terrace Elementary School
Baton Rouge, La. Architect: T. A. Broussard

QUALITY...PERMANENCY at LOW COST! Claridge continues to modernize and improve chalkboard and bulletin board manufacturing in step with new educational demands. 36 years experience concentrated on ONE purpose: the **FINEST** chalkboards and bulletin boards with greatest educational value. Schools and architects around the world name CLARIDGE to define their standard of quality.

NEW! Full Color Catalog

Larger, many real colors, more detail.
to help you solve
replacement, remodeling, or new
building problems. You'll find
much helpful information.



Claridge PRODUCTS and Equipment Inc.
HARRISON, ARKANSAS

☐ Please send catalog 120 ☐ Send samples or additional data on items circled below:

- | | |
|---|--|
| 1 Duracite Chalkboards in Seven Colors | 9 Claridge Factory Built Chalkboards and Bulletin Boards |
| 2 Grapholite Chalkboards | 10 Claridge Washable Chalkboards |
| 3 Asbestocite Chalkboards | 11 Vertical Sliding Chalkboards |
| 4 Horizontal Sliding Chalkboards | 12 Claridge Reversible Chalkboards and Bulletin Boards |
| 5 Vitracite Porcelain Enamel Chalkboards | 13 Extruded Aluminum Display and Trophy Cases |
| 6 Durasteel Chalkboards in Seven Colors | 14 Extruded Aluminum Bulletin Board |
| 7 Fabricork Fabric Surface Bulletin Boards | 15 Claridge Swing Leaf Display Boards |
| 8 Extruded Aluminum Chalkboard and Corkboard Trim | |

Name _____

School _____

Address _____

City _____ Zone _____ State _____



talk about
PROTECTION

NOTHING is protected like
the playing surface on the
ALL NEW Fold'n Roll for 1960!
(just one of many new BRINKTUN features)

Write for new Catalog and prices today!

Brinktun, Inc.
710 North 4th Street
MINNEAPOLIS, MINN.
NEW YORK OFFICE
1107 Broadway, N.Y.C.

SAFE MOWING

...even when children are present!



In MOTT—there's no danger of flying sticks, stones, and other debris. It's safe! The downward cutting action of the free-swinging flail-type blades and the shape of the hood deflect the clippings to the ground ... not so much as a blade of grass is tossed sideways! From 18" to 19 ft. gangs—there's a MOTT mower for any mowing job.

NOTE: Before you buy—see a MOTT demonstration!

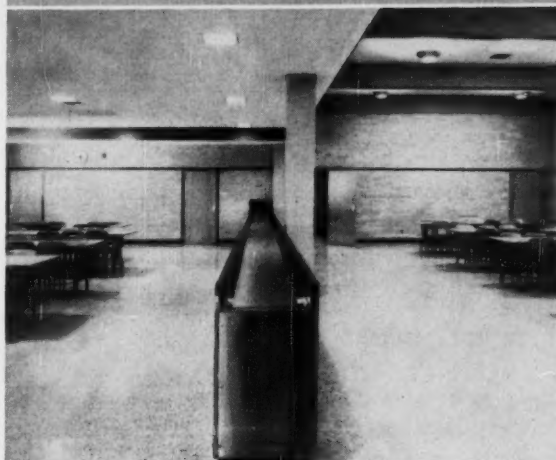


MOTT CORPORATION
4021 Eberly Street • Brookfield, Illinois

EFFICIENCY PLUS

...in Wichita's Public
School Cafeterias with

OLSON MECHANIZED DISH HANDLING CONVEYORS



Olson Conveyors now operate in 12 Wichita, Kansas public school cafeterias. The two oldest have operated daily for 30 years without one single major breakdown. These Olson Conveyors needed only periodic lubrication, cleaning and an occasional new belt—money-saving evidence that they were designed to provide long, trouble-free, continuous operation.

That's the way they're being designed and built today, too.

What Olson Mechanization means to any school—

- Less dishwashing help is needed
- Faster table turnover—more students fed in a smaller dining area
- Less dish breakage and clean dishes get back into service faster
- Better dining room layout is possible—dishwashing room can be located anywhere

Write for Bulletin 1505

OLSON CONVEYORS

MANUFACTURED BY
SAMUEL OLSON MFG. CO., INC.
2422 Bloomingdale Avenue Chicago 47, Illinois
DIVISION OF CHERRY-BURRELL CORPORATION

ACME CHEMICAL?

... One of the
best names I know



With them, quality comes first. I've never known Acme Chemical to skimp on the quality of a product to meet a price. Yet the price is always fair . . . and considering how far an Acme Chemical product goes, price doesn't mean as much to us as *use cost*.

Take their Acco-Kleen. Acco-Kleen is Acme Chemical's all-purpose liquid cleaner. We use it everywhere in our buildings. Formerly we bought an all-purpose cleaner that was a little lower in price but we had to use 4 cups to every pail of water in our daily cleaning. With Acco-Kleen we use 2 cups — and get perfect results. We're saving 32¢ on every pail of solution, and we average 8 pails a day. Multiply that by 200 school days in the year and you'll know

why we like
Acme Chemical quality.



Acco-Kleen is one of 80 fine products made by the Acme Chemical Company. Your Acme man is ready to explain how *quality* can reduce your cleaning costs.



Maintenance materials for the School Building . . .
serviced to your satisfaction.

Wall-Tite Water Cooler Is Modern in Design

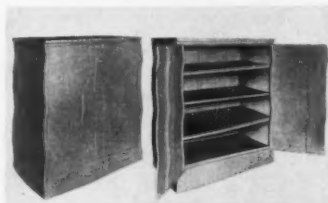


The modern design of the Halsey Taylor Wall-Tite Water Cooler conceals plumbing, saves floor space since the unit fits snugly against the wall, and facilitates installation. The Wall-Tite is available in six, 11 or 16-gallon capacities, stands 40 inches high and extends 13 inches from the wall. Its stainless steel top has a fully-contoured, splash-resistant basin and wall protective shield. Halsey W. Taylor Co., Warren, Ohio

For more details circle #872 on mailing card.

Swinging-Door Cabinet in 42-inch Height

An addition to the line of swinging-door cabinets developed by Borroughs is of-



fered in the new 42-inch high model. The new cabinet has the same features as the 78-inch high model now on the market, with the doors swinging completely open for full accessibility. Shelves are adjustable on two-inch centers without tools, nuts or bolts. Borroughs Mfg. Co., 3002 N. Burdick, Kalamazoo, Mich.

For more details circle #873 on mailing card.

Lead Pointer Adjusts for Length



Designed to give the user short, medium or long tapered points, the new Hunt lead pointer is easily adjusted. Lines for measuring the length of the lead are shown on the top of the small unit, which may be portable or fixed. The C. Howard Hunt Pen Co., 7th & State Sts., Camden 1, N.J.

For more details circle #874 on mailing card.

(Continued on page 200)

THE BURGESS-MANNING 3-WAY FUNCTIONAL CEILING

**UNIFORM RADIANT HEATING
UNIFORM RADIANT COOLING
UNIFORM SOUND ABSORPTION**

has the **6 POINTS of SUPERIORITY**

THAT MAKE IT YOUR BEST BUY

- STRUCTURAL SIMPLICITY
- MAINTENANCE ECONOMY
- ACOUSTICAL EFFICIENCY
- THERMAL PERFORMANCE
- VISUAL SATISFACTION
- FLEXIBILITY

Design & Physical



If you would have the ultimate in indoor comfort . . . specify the installation of a Burgess-Manning Ceiling. In addition to its superb comfort producing functions, financial benefits will accrue through economical fuel consumption and the very low maintenance costs throughout the lifetime of your building.

With heating, cooling and acoustical functions all located in the ceiling, every square foot of floor space becomes usable . . . there are no extra accommodation costs such as specially designed walls to carry service lines or ducts . . . no specially built wall recesses or protrusions to house heating or cooling devices.

No other ceiling installation can provide heating, cooling and sound absorption with equal advantages of structural simplicity . . . minimum maintenance requirements . . . mechanical and decorative design flexibility . . . and, operational efficiency.

Learn why in a few short years the Burgess-Manning Ceiling has been specified for more than 8 million square feet of building space. For a complete description functionally and mechanically, write for a copy of "The Story of the Burgess-Manning Ceiling."



BURGESS-MANNING COMPANY

Architectural Products Division
723 East Park Ave., Libertyville, Illinois

Electric Unit Ventilators Regulate Classroom Air



Heat, ventilation or natural cooling are provided with the new Syncretizer units for continuous and individual classroom ventilation. The new electric units utilize General Electric fin-tubular heating elements with automatic controls, and are

manufactured in five basic sizes. Units are fabricated on order to handle variations in size and voltage requirements for each installation. Safety features built into the new electric syncretizers include a disconnect switch that automatically cuts off power to the unit when the front enclosure is removed. Unit enclosures are of cold rolled steel with the exterior finish in baked enamel in any of six pastel colors. John J. Nesbitt, Inc., State Rd. & Rhawn St., Philadelphia 36, Pa.

For more details circle #875 on mailing card.

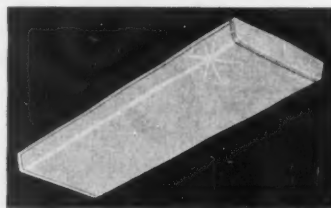
Adjustable Leg Extension for Lyon Steel Stools

Existing models of Lyon steel stools can be converted for leg adjustment with the

new adjustable leg extension recently introduced along with twenty new models of steel stools. The new models have adjustable feet, permitting increase of stool height in one-inch increments up to three inches. Stools are available with or without adjustable back rest, with plain steel or pressed wood over steel seats. The new adjustable leg extension can be added to any current model Lyon stool. Lyon Metal Products, Inc., Aurora, Ill.

For more details circle #876 on mailing card.

"Prismatic-100" is Economy Lamp Unit



Applicable almost anywhere, singly or in rows, the "Prismatic-100" is a new four-foot, four 40-W-RS lamp economy unit. Designed as a companion to the two-lamp "Prismatic-50," the new unit has clear panoramic plastic lens, white enameled steel parts, and is recommended for use with white ceilings and light walls for maximum efficiency. The Wakefield Co., Vermilion, Ohio.

For more details circle #877 on mailing card.

Self-Cleaning Coal Conveyor Has Two-Way Motor Drive

Two-way, switch-controlled motor drive on the new Will-Burt coal conveyor makes it possible to eject obstructions by reversing coal screw rotation. The self-cleaning unit can be specified for horizontal, cross feed, tandem or vertical operation. Coal screws and flanged coal screw housings are made in matched sections and can be assembled to operate at any angle, with single or dual discharge chutes. The Will-Burt Co., Dept. NS, Orrville, Ohio.

For more details circle #878 on mailing card.

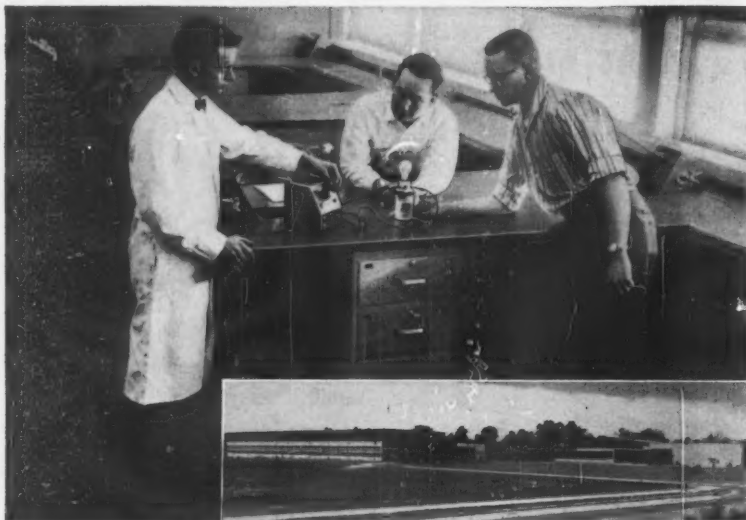
Streamlined Features Offered in Buffalo Food Cutter



The newly designed Buffalo Food Cutter with a capacity of seven pounds features a fabricated steel bed plate. The sealed gear reduction running in oil eliminates oil leakage, has longer life and requires less servicing. Model 114D is available with or without the pedestal for bench installation. John E. Smith's Sons Co., 50 Broadway, Buffalo 3, N.Y.

For more details circle #879 on mailing card.
(Continued on page 202)

BEST POWER SUPPLY for your present science facilities



TEACHING WITH **Lab-Volt**—William W. Bohn, science department head, inspecting student experiment on conductivity of fluids at Edison Township High School, Menlo Park, N.J.

"Variable electrical power for science experiments was not provided in our new high school," reports Bill Bohn, head of the science department at Edison High.

"We carefully examined all available means of supplying variable AC and DC current for educational purposes and found **Lab-Volt** portable units the only practical solution to our problem. No installation was necessary and we could simply 'plug in' wherever we needed complete AC and DC service."

"We now have **Lab-Volt** portable service for all science students and strongly recommend them wherever labs are without permanent AC and DC power appropriate for electrical experiments."



All models are U.L. approved.

➔ **FREE TEACHING AIDS . . .** Sample illustrated experiments available on request.
Write for complete **Lab-Volt** catalog today.

BUCK ENGINEERING COMPANY, INC.

MARCY STREET, FREEHOLD, NEW JERSEY • FREEHOLD 8-1111

See Lab-Volt at Atlantic City, Booth No. 1033



From his desk, Dr. J. C. Witter, Superintendent of Schools, Caney, Kansas, is in instant two-way conversation with teachers.



Teacher saves steps; she answers calls from any point in room. Call from principal is announced by bright red privacy light. Teacher can also call principal.



Portable amplifier and loudspeakers provide P.A. facilities for the auditorium, gym and athletic field . . . including announcements to spectators.

For schools with low-budget problems

Executone provides complete communications, classroom privacy

Caney, Kansas, schools get all the many features of expensive console sound systems with simplified, low-cost Executone intercom. This inexpensive, all-purpose system saves time and energy for teachers and principal, increases administrative efficiency. Schoolwide announcements can be made from the principal's desk. School programs, recorded music, speeches, special events, emergency dismissals, every form of sound system transmission can reach all school areas, as well as individual classrooms.

You get these plus advantages with Executone:

- **Lower Cost**—Expensive console features now possible with new simplified wiring circuit.
- **Easy to Operate**—No complicated, confusing control panels.
- **Easily Installed** in existing schools. In new construction, additional savings possible on wiring.
- **Small Initial Investment**—Starting with intercom, schools can add sound system features as required.
- **Space Saving**—Principal's compact control station needs only small fraction of space required by console.

More time for teaching! Teachers like the system. It saves them steps, time and energy . . . so students benefit, too! Find out what Caney schools have learned . . . how Executone School Intercom can improve *your* school administration. Just send coupon for more information.

Executone

SCHOOL COMMUNICATION SYSTEMS

Manufacturers of School-to-Home telephone equipment for shut-ins

EXECUTONE, INC., Dept. J-11
415 Lexington Ave., New York 17, N. Y.

Without obligation please send:

- ☐ Complete details on Caney Schools' communication set-up
- ☐ Other free descriptive literature.
- ☐ Name of local representative.

Name _____
School _____
Address _____
City _____ Zone _____ State _____

In Canada—331 Bartlett Ave., Toronto

Easy-Open Container for Klenzade Products



The 50-pound "Klenz-Pak" is a special corrugated shipping container for Klenzade cleaning products. A zip-open "tear-tape"

permits opening by pulling on the starting tab to cut the corrugated board on three sides. The fourth side acts as a hinge for the cover which fits over an interior corrugated board liner for protection of contents until used. Powder is packed in a polyethylene bag with a re-usable closure.

Klenzade Products, Inc., Beloit, Wis.

For more details circle #880 on mailing card

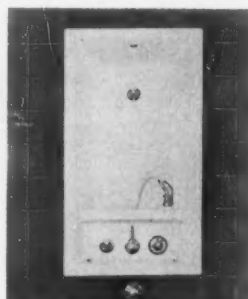
Technamation A-V Technic Makes Transparencies Move

An easy and inexpensive way to add colorful motion to ordinary still transparencies is available in a new audio-visual teaching technic called Technamation. A special refraction material is attached to the transparency to give the motion effects.

The Technamation material looks like sheets of acetate and is self-adhesive. The "technamated" transparency, projected from an overhead projector, has a motorized polaroid disc attached to the objective mount so that the disc rotates in the light path. The changing polarized light actuates the motion patterns fixed to the transparency. Motion effects can be made in any direction, at any speed and in any combination of directions and speeds. American Optical Co., Instrument Div., Buffalo 15, N.Y.

For more details circle #881 on mailing card.

Classic Drinking Fountain Features Modern Design



Heavy vitreous china facilitates maintenance in the new Classic recessed drinking fountain designed for use in modern interiors. Features include a push-button glass filler faucet through the back, a brass strainer, self-closing lever handle stop and positive shut-off service valve. All exposed fittings are chromium plated. Universal-Rundle Corp., New Castle, Pa.

For more details circle #882 on mailing card.

Hot Toasted Sandwiches Available from Vender

The new Star Hot Toasted Sandwich machine, which serves 150 hot or cold sand-



wiches, pastries or other items, is now available for institutional use. Foods are kept fresh under 42-degree refrigeration, and an infrared oven warms or toasts them, or serves the food cold, as desired. Five different selections can be supplied for 24-hour service in cafeterias, dormitories, special departments or wherever indicated. Heating and toasting are done on a 20-second cycle. The refrigeration unit is hermetically sealed and has variable thermostatic control to hold temperature at any desired level. Star Cooler Corp., 9271 Manchester Rd., St. Louis 17, Mo.

For more details circle #883 on mailing card.

(Continued on page 204)

Palmer Method's DIAMOND 75th ANNIVERSARY 75 years of acceptance by the schools of America

This, our 75th year, we have available the *newest* editions in both cursive and manuscript writing.

Please contact us
if your pupils
are having any
handwriting
difficulties. We
work with one
subject only —
handwriting.



Write for information and
free catalog.

PLAN TO VISIT
THE "PALMER" BOOTH—
NO. G-12 — AT THE
1960 A.A.S.A. CONVENTION

PALMER METHOD

A. N. PALMER CO.
902 S. Wabash Ave., Chicago, Ill.
55 Fifth Ave., New York 3, N. Y.

Enrich Your Teaching Program



with Nystrom Models, Charts, Globes and Maps

ELIGIBLE FOR PURCHASE UNDER PROVISIONS OF TITLE III OF THE NATIONAL DEFENSE EDUCATION ACT.

SCIENCE

MODELS

Anatomy ... Biology

CHARTS

Anatomy ... Biology ...
General Science ...
Physiology

GLOBES

Physical ... Celestial ...
Satellite ... Planetarium ...
Globe-Reading Activity Cards

MAPS

Physical ... Thermal ...
Rainfall ... Outline

MATHEMATICS

GRAPH CHARTS

Rectangular ... Polar

MARKABLE SPHERES

FOREIGN LANGUAGE

FOREIGN TEXT MAPS

French ... German ...
Russian ... Spanish

FOREIGN TEXT GLOBES

French ... Spanish

A. J. NYSTROM & CO. 3333 ELSTON AVE. CHICAGO 18, ILL.

FREE!
N.D.E.A.
CATALOG

I would like to know more about Nystrom materials which can be purchased under N.D.E.A. Please send me your colorfully illustrated catalog No. NS260.

NAME _____

POSITION _____

ADDRESS _____

A. J. NYSTROM & CO.



**3333 ELSTON AVENUE
CHICAGO 18, ILLINOIS**

Send Today for this New Data on Upward-Acting Doors for Every Need



Kinnear originated the interlocking slot door

Get full details on this complete line of time-saving, cost-slashing doors. They add highest efficiency to space-saving, coiling upward action. Kinnear offers a wide choice of flat and curved slats—fabricated of aluminum, zinc-coated steel, or other metals. They fit every need, from small counter openings to largest doorways. Slat sizes range up to the seven-inch "Goliath" slat at the extreme left, above — maximum protection against wind,

weather, intrusion or vandalism!

Zinc-Coated Dual Protection

Kinnear Steel Rolling Doors feature extra-heavy hot dip galvanizing! 1 1/4-ounces of pure zinc per square foot of metal (in accordance with ASTM standards). And Kinnear's special phosphate treatment makes this zinc surface ready *immediately* for thorough paint grip.

Make sure you get this complete door guide — check it *now*!

KINNEAR
ROLLING DOORS
Saving Ways in Doorways

The KINNEAR Mfg. Co.

FACTORIES:

1200-30 Fields Ave., Columbus 16, Ohio
1742 Yosemite Ave., San Francisco 24, Calif.
Offices and Agents in All Principal Cities

Automatic Roasting Controls Put Automation in Cooking

Better roasts with increased servings per pound are assured with the automatic roasting controls developed by Minneapolis-Honeywell. An ElectroniK strip chart re-



corder monitors oven temperatures when the automatic controls are set, providing a permanent record of oven performance. Overcooking, with subsequent waste, is prevented as an alarm sounds when the desired internal meat temperature is reached, and a light remains on the control panel until the temperature-sensing element inside the oven is disconnected. Minneapolis-Honeywell, Brown Instrument Div., Wayne & Windrim Aves., Philadelphia, Pa.
For more details circle #894 on mailing card.

Repair Parts Kit for American-Standard Faucets

The Sexauer Handy Andy No. 28 Assortment is a kit of assorted repair parts specifically designed for servicing American Radiator-Standard Sanitary Corporation's series "R" and "B" faucets. The compact kit includes the right quantity and variety of essential small repair parts and contains 421 items in all, packaged in a sturdy metal carrying case with divided tills. J. A. Sexauer Mfg. Co., 2503 Third Ave., New York 51.

For more details circle #885 on mailing card.

Utility Pick-Up Truck Available in Two Models

New features on the White utility pick-up truck give it greater usefulness with less effort. It is available in two models, one with two fixed wheels on the rear, and



the other with two rear wheels and swivel casters in front. Smooth round push or pull handles also improve maneuverability and the sturdy steel frame, finished in satin black, folds flat for storage. Designed for quick collection of waste, soiled linen or other materials, the truck is available with detachable white duck bag with large brass grommets, or optionally with a black flame-resistant bag. White Mop Wringer Co., Fultonville, N.Y.

For more details circle #886 on mailing card.

(Continued on page 208)



IN THIS AGE OF MISSILES

windows need *Tuf-flex*® glass! *Tuf-flex* tempered plate glass is 3 to 5 times tougher than regular plate glass of the same thickness. And if *Tuf-flex* is broken, it is safer because it breaks into relatively small crystals. Play safe — use *Tuf-flex* tempered plate glass for corridor windows and windows facing playgrounds. Consult your L·O·F Distributor or Dealer (listed under "Glass" in the Yellow Pages). Libbey·Owens·Ford Glass Company, Toledo 3, Ohio.

LIBBEY·OWENS·FORD *a Great Name in Glass* TOLEDO 3, OHIO



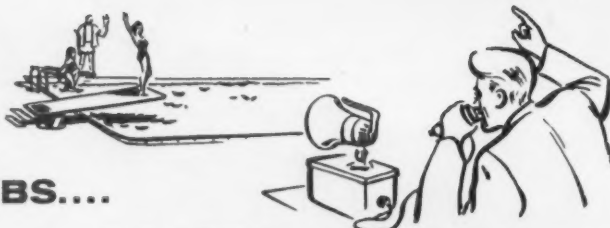
New, portable P.A.

COVERS 2 ACRES...

WEIGHS JUST 13 LBS....

COSTS ONLY...

\$159.50 Complete!



Use Porta-Chief for announcements and paging . . . instruction . . . aquatic sports, games, meets, etc. Pick it up and take it *anywhere*. Rugged "TP" (transistor-powered) 20 watt amplifier runs on *dry* batteries—all self-contained in watertight case. At one-quarter the cost of the smallest conventional *fixed* system—you can *control* your audience and *stop killing* your voice. For full details write:

AUDIO EQUIPMENT CO., INC.

Port Washington 15, New York.
(Makers of Audio Hailer)



TP PORTA-CHIEF
transistor-powered
PORTABLE 20 watt P. A.

YOUR ARE CORDIALLY INVITED TO
BOOTH 1512 and 1514

AT THE AASA CONVENTION FOR A
DEMONSTRATION OF LOW COST

EUREKA

Starline

SCHOOL FURNITURE



**EUREKA WILLIAMS
CORPORATION**

Factories at
Bloomington, Illinois—
Canastota, New York



**ELECTRIC SCOREBOARDS — THE CHOICE OF
COACHES IN 48 STATES, CANADA and EUROPE**



Model 250-6 — Most Popular Board Made
E-Z READ NUMBERGRAMS • TRANSLUCENT NAME
PANELS • MULTI-COLORED LIGHTS • VIBRATOR
HORN • TIME-OUT CLOCK (Optional) • FIVE BRIL-
LIANT COLORS

Overall Size 72" x 34" x 6". Letters 5" High
6 1/2" x 10" Colored Numbergrams

Write for literature and prices on all Scoremaster Score-
boards today and information on customized boards. You'll
be glad you did.

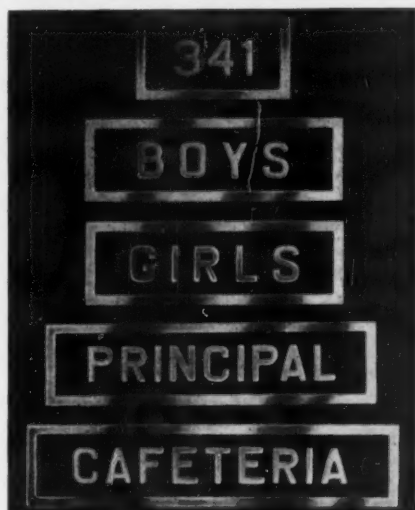
THE M. D. BROWN COMPANY

2219 Lake St.

Niles, Mich.

"When Split-Seconds Count, Count On Scoremaster"

**Raised Letter
ALUMILITED ALUMINUM
SIGNS AND DOOR NUMBERS**

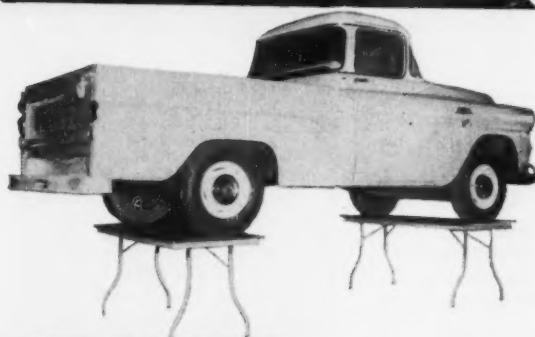


Our Low Prices Will Surprise You!
Ask For Our Style No. 870 "Enduro" SIGNS

SPENCER INDUSTRIES

1508 N. MASCHER ST.

PHILADELPHIA 22, PA.



**PROVEN
STRENGTH!**

Actual photograph above hints at the rugged, long-haul strength of Metwood tables. This tri-balance strength performs in some of America's finest institutions. Send for literature today, without obligation. Find out why professional buyers who check and test—choose Metwood!

**metwood
hanover**

FOLDING TABLES

**FUND-RAISING
BOOKLET FREE!**

A service for clubs,
churches, etc. Write
without obligation!

Hanover, Pa.

**LOOK "UNDER THE HOOD"
of LABORATORY SERVICE FIXTURES**

*(the repair man will...when
inferior fixtures break down)*



here's why
leading architects and
engineers specify

T&S Lab-flo®

SERVICE FIXTURES

Let's be hard-nosed about it. When a laboratory is installed, only the best possible service fixtures will do. Architects, specifying engineers, and plumbing contractors know it no matter how well designed the science equipment is, it will operate only as well as its fixtures.

It's a fact that there are important differences in fixtures used for laboratory furniture and it takes such experts to recognize them—even the busy repair man on his frequent trips to replace ordinary washers, re-grind worn seats, or to install whole new units because of stripped threads. That is why T&S Lab-Flo Service Fixtures, heavy duty engineered and constructed throughout especially for laboratory use, are preferred for wood or metal installations of any size or design. Lab-Flo is built for strength, safety, and ease of handling in the laboratory. No thin walls or shallow threads to break down, no weak parts to give out when full line pressure is applied. Look at a cross-section of a Lab-Flo fixture and you will see a cross-section of quality at its finest. You pay for quality—why not get it? You will...when you specify Lab-Flo right down the line on your next laboratory installation, new or remodeled.

THOSE IN THE KNOW SPECIFY **Lab-flo**

See your **Lab-flo** dealer or write for Catalog

SERVICE FIXTURES • HOSE COCKS
REMOTE CONTROLS • RECEPTACLES

Refer to 1960 Sweet's Catalog, Code: 27b
Ta



T & S BRASS AND BRONZE WORKS, INC.
128 MAGNOLIA AVE., WESTBURY, L.I., N.Y.
Telephone: EDgewood 4-5104





AO's New Opaque Delineascope Brighter...Lighter... ...more convenient

BRIGHTER AO's New High-Speed Opaque Delineascope projects a brighter image than any other opaque projector you can buy...a full 145 lumen output. Screen illumination is uniform from edge to edge and definition is sharp from corner to corner.

Only American Optical uses all-glass reflecting surfaces to provide maximum illumination intensity. Glass reflectors will not tarnish or deteriorate...will not scratch with cleaning. Your AO Opaque will still produce the brightest screen image, even after years of service.

LIGHTER AO's New Opaque Delineascope is easily portable...weighs just 29 pounds. Copy platform is extra deep...plenty of room for material up to 2½ inches thick. Elevation locking device positions platform instantly at any desired level.

MORE CONVENIENT Adjustments for focus, optical pointer, switch and roll feed are all controlled quickly and conveniently from the right side of instrument...where they belong.

Ask your AO Sales Representative for a convincing demonstration or write...

**American Optical
Company**



INSTRUMENT DIVISION, BUFFALO 15, NEW YORK

Dept. B35

- ☐ Please send full information on AO's New Opaque Delineascope.
☐ Please have my AO Sales Representative set up a demonstration.

Name _____

Address _____

City _____ Zone _____ State _____

IN CANADA write — American Optical Company Canada Ltd., Box 40, Terminal A, Toronto, Ontario

Diagnostic Audio-Analyzer Facilitates Hearing Tests

Thirteen major pure tone and speech tests can be made with the new Zenith diagnostic Audio-Analyzer. More than five years of engineering research preceded in-



roduction of the new instrument. It consists of a basic audiometer known as the ZA-200 which can be expanded by adding the ZA-400, a Diagnostic Desk Speaker which permits speech testing by either recorded or monitored live voice, or the ZA-402 Diagnostic Desk Speaker which permits the student to be tested without headphones in a sound field while wearing a hearing aid. New developments make the instruments practical for all types of tests, and they are supplied in matching cabinets with burnproof, chemical proof and abrasion resistant surfaces. **Zenith Radio Corp., 6001 W. Dickens Ave., Chicago 39.**

For more details circle #887 on mailing card.

Vegetable Oil Coating Keeps Foods From Sticking

Vegalene is a pan coating which prevents food from sticking to pots and pans, whether used in cooking, frying or baking. A blend of highly refined vegetable oils, compounded lecithin and vegetable stabilizers, it will not form a carbon residue, does not become rancid and will not break down with heat. Vegalene has a high smoke and flash point for safety near open flames and is packaged in a spillproof plastic bottle. **Par-Way Co., 2360 S. Garfield Ave., Los Angeles 22, Calif.**

For more details circle #888 on mailing card.

Improvements and Modern Design Incorporated In Diaspron Typewriter

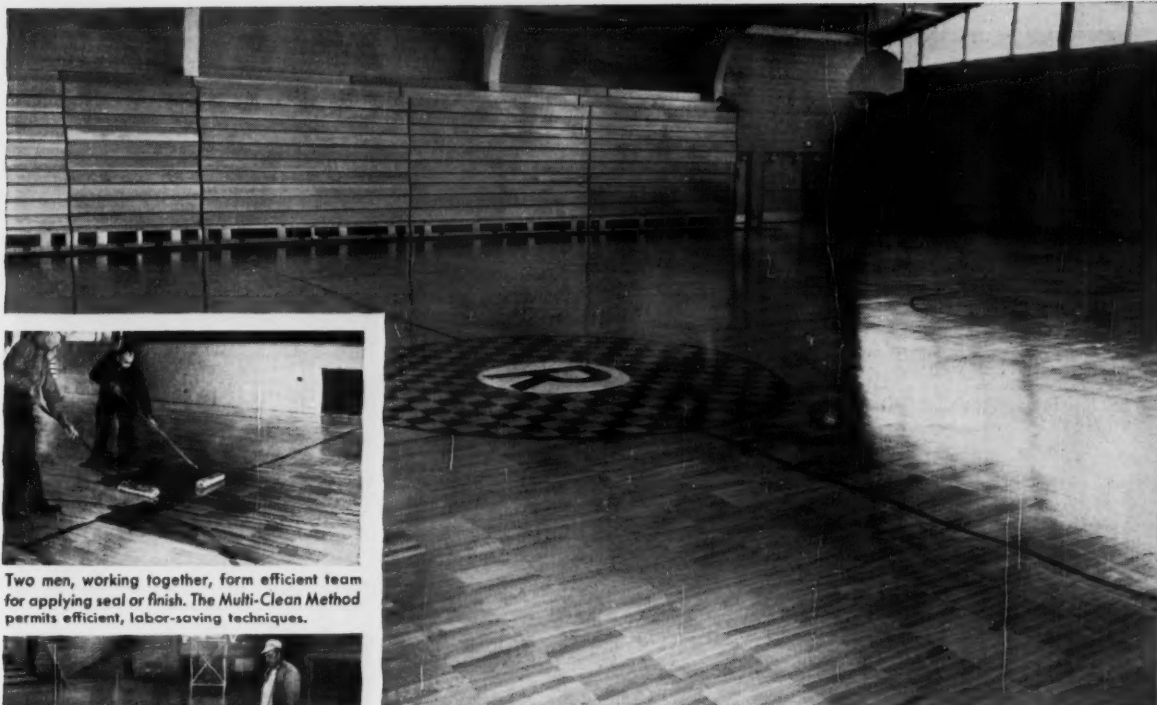
The Diaspron, a newly styled typewriter designed for hard, continuous use, com-



bines a new light touch with perfect alignment and neatness and clarity of typescript. Multiple-function controls provide ease and convenience of operation, thus increasing typing speed. Among other features are a four-position ribbon control and horizontal and vertical half-spacing. **Olivetti Corp. of America, 375 Park Ave., New York 22, N.Y.**

For more details circle #889 on mailing card.

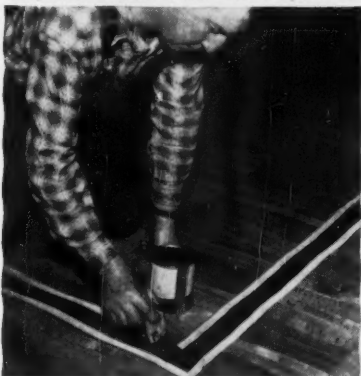
(Continued on page 210)



Two men, working together, form efficient team for applying seal or finish. The Multi-Clean Method permits efficient, labor-saving techniques.



Floor is steel woolled and mopped after sealing; also, between coats of Multi-Clean Gym Finish.



Game lines are painted in after floor is sealed, but before Multi-Clean Gym Finish is applied.

How to choose the best finish for your gymnasium floor

Here are important qualities you should insist on when you select a finish for your gymnasium floor . . .

It must be hard, smooth, tough, elastic, light-colored, non-slippery, resistant to scuffing and rubber marks.

It must be fast playing and possess high gloss, yet permit minimum glare.

Multi-Clean Gym Finishes excel in all these respects . . . and more.

Made from newest resins

HI-POLAMUR Floor Seal and POLI-MIRRO Floor Finish are made from the newest polymer resins. This creates a light-colored, mirror-like surface that is exceptionally hard and resistant to scuffing and rubber marking. Penetration and coverage

are both extremely good. Usually dries in 3-4 hours with virtually no odor. Easy to clean, too.

3 coats do job of 4

Another effective pair consists of Multi-Clean PENETRATING SEALER followed by Multi-Clean GYM FINISH. This combination is economical, too, because it accomplishes as much with 3 coats as most ordinary gym finishes do in 4!

For informational bulletin or filmstrip showing complete MULTI-CLEAN METHOD for initial treatment or restoration of old gym floor, see your local Multi-Clean Distributor or write to Multi-Clean Products, Inc., St. Paul 16, Minn.



MULTI-CLEAN PRODUCTS, INC., Dept. NS-59-20
St. Paul 16, Minnesota

- ☐ Please send information on MULTI-CLEAN METHOD for initial treatment and re-finishing gym floors.
- ☐ I'd like to see filmstrip, "Installation, Finishing, and Maintenance of Gymnasium Floors".
- ☐ Please send detailed information on the scientific MULTI-CLEAN METHOD for maintaining other type floors. (specify type) _____

Name _____ Title _____

Address _____

City _____ Zone _____ State _____

"See Multi-Clean in action at Booths B-19 and B-21, American Association of School Administrators Convention."

Weber Costello Chalkboard



SETS
THE PACE
TODAY

as it has
for
3 Generations!

The outstanding line of chalkboard today from a standpoint of highest quality, scientific writing surface and overall construction, just as it was the best available three generations ago. A complete line of chalkboards, to meet every budget, distributed through high caliber qualified distributors and backed by an honest-to-goodness service policy that goes on and on after the installation is made.

**WEBER COSTELLO
CHALKBOARD,**

**CHALK
AND
ERASERS
ARE THE**

**Best
in every
class!**



Weber Costello
Co.
World's Finest

WRITE FOR
LITERATURE

WEBER COSTELLO CO.

Chicago Heights, Ill.
Toronto, Ontario

Manufacturers of Chalkboard, Chalk, Erasers,
Art Material, Maps, Globes

Punching and Plastic Binding Done By Single-Unit Machine

A single-unit punching and plastic-binding machine weighing less than 10 pounds



is added to the American Photocopy line. Called the ComBind Bindak, the unit may be moved from department to department easily and has the added convenience of an operating handle which can be removed and inserted in either side of the unit, permitting left or right-handed persons to use the machine. It is finished in brown and beige with chrome-buffed trim and is economically priced. American Photocopy Equipment Co., 2100 Dempster St., Evanston, Ill.

For more details circle #890 on mailing card.

Power Tool Combination Is Handy, Inexpensive Unit

Designed to be used as either a high-speed plane or as a router, the new Skil combination power tool reduces costs. The combination unit consists of a 3/4 h.p. router motor, router base and plane attachment. The plane attachment and router motor can be purchased as the Model 296 Router Plane, or the router base and the motor unit are sold as the Model 297 Router. The Router Plane has a 16-inch plane shoe with chip deflector, a depth control adjustment which can be set while in operation, and a micrometer adjustment. Skil Corporation, 5033 Elston Ave., Chicago 30.

For more details circle #891 on mailing card.

Full Line of Closed-Circuit TV for Educational Needs

Five closed circuit television cameras and two monitors for educational and commercial use are now available in the Motorola line. Designed for operation by non-technical personnel, two of the cameras have but one operating control, an on-off



switch. The basic general purpose camera is available in four versions and is a quality, highly sensitive, stable instrument weighing 12 pounds. Remotely controlled functions can be added to the camera. The Motorola educational monitor is the Classroom 21, capable of switching from a closed circuit to standard broadcast signals by turning a single control. The front-mounted loudspeaker can be used as an audio amplifier. Motorola Communications and Electronics Inc., 4501 W. Augusta Blvd., Chicago 51.

For more details circle #892 on mailing card.

(Continued on page 212)

THE RECREATION LINE

WHEREVER CHILDREN PLAY

Safety!

Recreation equipment with engineered safety to meet the most rigid requirements.

- Playground Equipment
- Indoor Basketball Backstops
- Swimming Pool Equipment

Literature for each line available on request—please specify.

DEALER INQUIRIES INVITED

**RECREATION
EQUIPMENT CORP**
Dept. NS-260 — 724 W. 8th St.
Anderson, Indiana



1 Ton per sq. in. — That's the dent which a 125 lb. female, teetering on today's 1/4" "spikes," makes! — No wonder those thin-skinned floorings can't take P.T.A. meetings any more!

**FLOOR YOUR NEW
MULTI-PURPOSE ROOM
with**



NORTHERN MAPLE

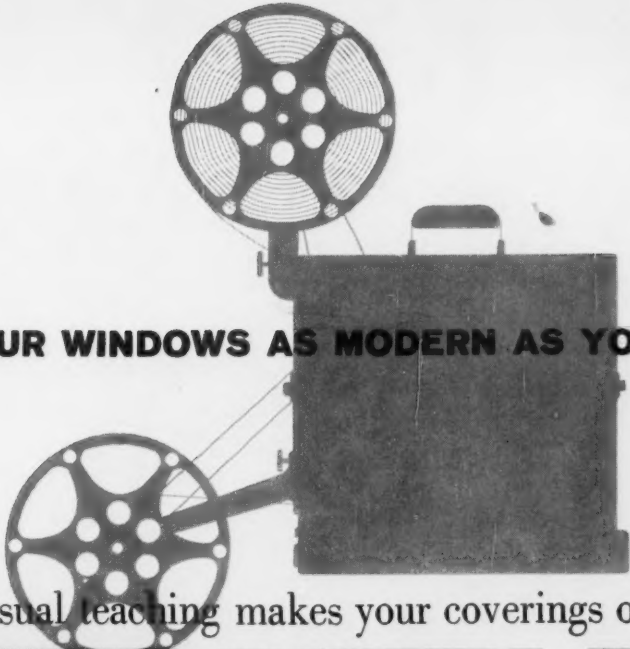
Bouncier, easier on the feet, and best floor for basketball and gym, J. W. Wells DIAMOND HARD Northern Maple is also a real economy in any combination gym-auditorium where "Spikes" (and dents) are real threats.

WRITE FOR FREE LITERATURE

**J. W. WELLS
LUMBER COMPANY**

Menominee 4, Mich.

The NATION'S SCHOOLS

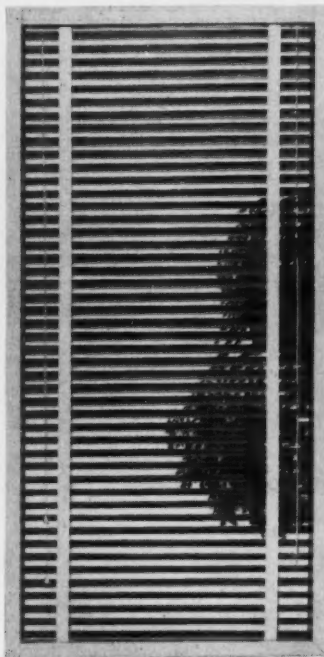


ARE YOUR WINDOWS AS MODERN AS YOUR METHODS?

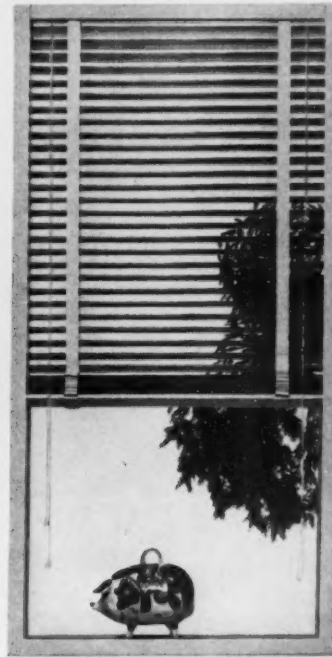
Audio-Visual teaching makes your coverings out of date unless...



**THEY MAKE ANY ROOM BLACK-OUT
DARK IN SECONDS...EVEN AT NOON!**



**YET GIVE AN INFINITE
RANGE OF LIGHT CONTROL!**

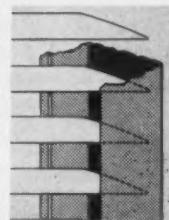


**AND COST LITTLE TO START
WITH...LESS TO MAINTAIN!**

Sure, black-out coverings get the room dark. But they don't cut down on glare. Sure, conventional coverings control daylight. But they don't achieve an effective black-out. That's why both are as out of date as a one-room school! Only Flexalum Audio-Visual blinds can give you the precise light control you need for everyday class activities... and *also* plunge the room into absolute darkness for Audio-Visual teaching. Reasons: Flexalum is made with more slats, which means greater overlap—plus special light channels which keep light out around the sides. All this and you *save*, too. Because Flexalum also gives more years of service than any other type of window covering... *a promise we back with a five-year written guarantee.* Look into Flexalum for your school.

Write for test results and specification data to: Bridgeport Brass Co.—Hunter Douglas Division, 405 Lexington Ave., New York 17, N. Y.

AUDIO-VISUAL BLINDS
Flexalum®



Newest Flexalum exclusive:
plastic-lined side-channels
eliminate noisy "flutter."

Everett's new school piano



A school piano must be able to take hard use in stride. The new Everett Style 11 does. With extra-sturdy backposts for greater tone stability, and "childproof" locking top and fallboard, the Style 11 faces up to responsibility like the professional it is . . . The reason why Everett is the choice of more than 7,000 leading schools, colleges and churches. Write for Style 11 Report and List of 7,000. Everett Piano Company, South Haven, Michigan.



212 For additional information, use postcard facing Cover 3.

Mikro Master Dispenser for Sanitizing Dishes

A compact, automatic, self-contained unit for injecting Mikro-Kleen DF sanitizer concentrate into the final rinse water for dishes and glassware is offered in the Mikro Master. Developed to provide low bacteria counts while producing spot-free food service utensils and glassware, the Mikro Master requires no pre-mixing of the sanitizer solution, and injects only when the final sanitizing rinse valve opens. It is easy to install and maintain. Economics Laboratory, Inc., 250 Park Ave., New York 17.

For more details circle #593 on mailing card.

3-Dimensional Plastic Maps in Easily Handled Size



Mountains and valleys in detailed relief that stands up nearly a half inch are shown in the new Aero plastic three-dimensional maps of the World and the United States. Now available in an easily handled 28 by 18-inch size, the relief maps are printed on a new durable vinyl plastic tough enough to be walked on and coated for protection against dust, dirt and fingerprints. They are designed as study aids for geography, history and social studies. The 50-state United States map shows 4000 geographic names and a map index which slides out from the back of the map locates all of the place names shown. The companion World relief map has nearly 2500 place names and includes the pull-out map index. Aero Service Corp., 210 E. Courtland St., Philadelphia 20, Pa.

For more details circle #894 on mailing card.

Portable Dish Cart Has Large Storage Space



Made of stainless steel, fully insulated and fitted with adjustable dish nesting compartments, the new Lincoln portable dish cart can be wheeled to place of need. There is plenty of storage area in the lower section and the unit can dispense up to 360 nine and one-half inch plates or 268 10 by 14-inch compartment trays. It is available in several sizes. Lincoln Mfg. Co., Inc., P.O. Box 2313, Fort Wayne, Ind.

For more details circle #895 on mailing card.

(Continued on page 214)

The NATION'S SCHOOLS



How \$6.07 paid for all this PYREX ware

Smart buyer in small school gets together with his lab supplier and discovers there is a line of low-cost PYREX brand labware for students.

He puts together an order of *twenty packages* of glass and gets ware like this at prices that please the most pinching of budget committees.

Two-piece cylinder: \$1.29. 50 ml PYREX glass column in plastic base. Hexagonal base prevents rolling, reduces breakage. Even should breakage occur, only the glass is replaced. Sizes: 25, 50 and 100 ml.

West condenser: \$3.39. Improved design of the classic West condenser, 400 mm jacket. Extra glass and strength added at tubulations and to seal between tube and jacket. Sizes: 100 through 750 mm.

Boiling flask: \$.77. Like all PYREX ware this 500 ml round-bottom flask resists thermal and impact shocks.

Reagent bottles: \$.62 each. Polyethylene stoppers help hold costs down on these 125 ml bottles. 250 ml size also available.

All this ware is made with the stu-

dent in mind. Reinforcement is provided at all weak spots in anticipation of rough handling. The glass is thicker than you ordinarily get in other brands.

You'll find many such low-cost items listed in LG-1, the PYREX Labware Catalog, and its Supplement No. 3. If you lack a copy of either, call your lab supply dealer, see your Corning salesman, or write us direct.



CORNING GLASS WORKS

13 Crystal Street, Corning, N. Y.

CORNING MEANS RESEARCH IN GLASS

PYREX® laboratory ware . . . the tested tool of modern research

Argus Film Splicer for Clean, Quick Splice

Designed for use with both eight and 16mm film, the new Argus motion picture



film splicer employs dry splice tape to produce a clean, quick splice without scraping, over-lapping or gluing. The pocket-sized Splicer cuts an "S" joint which eliminates the loss of film loop, thus preventing

jamming in the projector caused by bends. Argus Cameras, Inc., Ann Arbor, Mich.
For more details circle #896 on mailing card.

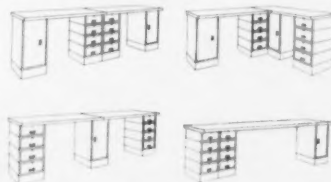
New Pan Sizes Added to Bloomfield Line

Five new sizes of stainless steel pans with accompanying covers are added to the Bloomfield line of sectional pans for food service. The new units have precision tapered sides, corners have full thickness of metal and are perfectly rounded for ease of cleaning and sanitation. The pans can be furnished with flat, nesting-type covers for food protection and easy stacking. Bloomfield Industries Inc., 4546 W. 47th St., Chicago 32.

For more details circle #897 on mailing card.

Tolerton Work Benches Have Cabinet Bases

Designed to fill any requirements for storage, the new Tolerton cabinet base work benches are offered in several styles. The Model TCDB-3072-W has risers four, five and six inches high to provide the desired height, with a wide variety of room arrangement possibilities. The top can be any size and thickness to meet the need. Base Cabinet Model TBC-1 is equipped with an adjustable shelf on two-inch cen-



ters, and Model TDC-1 has a four-drawer cabinet. The Tolerton Company, Alliance, Ohio.

For more details circle #898 on mailing card.

Locking Cabinet File Holds Sound Recording Tapes

Especially designed for language laboratory use, the new No. 99T sound recording



tape file is a companion to the disc record file. They will stack interchangeably, and the tape file has space in the rear for spare reels. The locking cabinet is made of welded heavy gauge steel. Jack C. Coffey Co., Inc., 710 Seventeenth St., North Chicago, Ill.

For more details circle #899 on mailing card.

Dodge 1960 Bus Chassis Available in two models

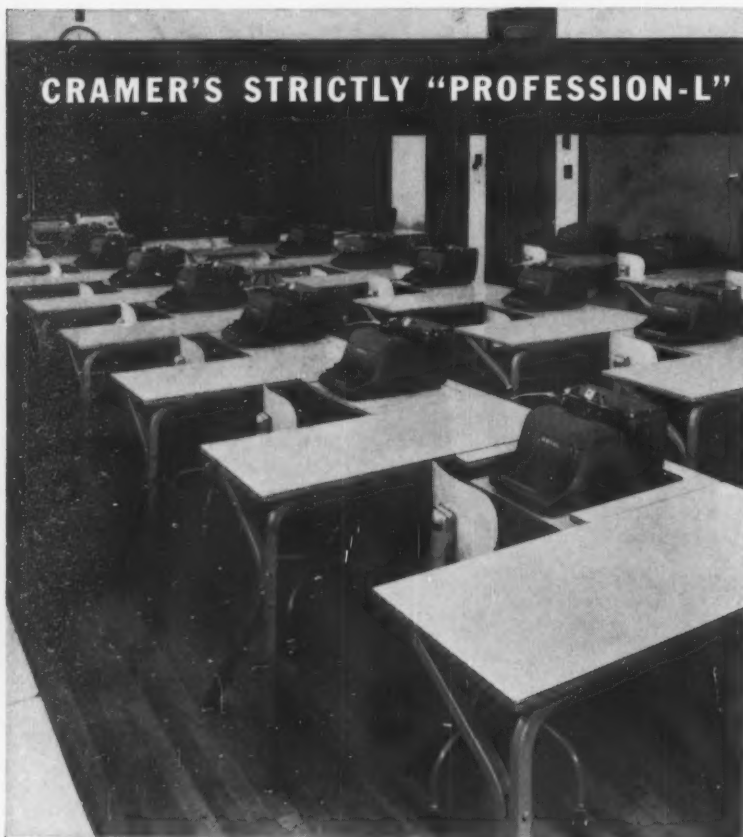
The new 1960 Dodge school bus chassis are now available and feature improve-



ments for maximum safety and ease of operation. Included are dual headlights, hydraulic brakes with up to 506.34 square inches of lining area, and a heavy-duty, extra-rigid frame. Two models, the S400 and the S600, with tonnages of 1½, 2 and 2½, are announced. The illustration shows the new chassis with a 66-passenger bus body made by Superior Coach. Chrysler Motors, Dodge Div., 7900 Joseph Campau Ave., Detroit 11, Mich.

For more details circle #900 on mailing card.

(Continued on page 216)



CRAMER'S STRICTLY "PROFESSION-L"

Place your students in the authentic office atmosphere of Cramer Profession-L Laboratory Furniture and watch them learn faster. With Cramer's sleekly trim modular combinations, your classroom becomes an office where business training is easier—economical, too.

Cramer saves space: 7 basic free-standing units, plus 3 auxiliary units, combine to make hundreds of practical units. You can teach Typing, Shorthand, Bookkeeping, Machine Practice and General Business in one classroom.

Cramer saves cost: Engineered and constructed to last many years with practically no maintenance. Plastic tops. Units will not "walk" from vibration.

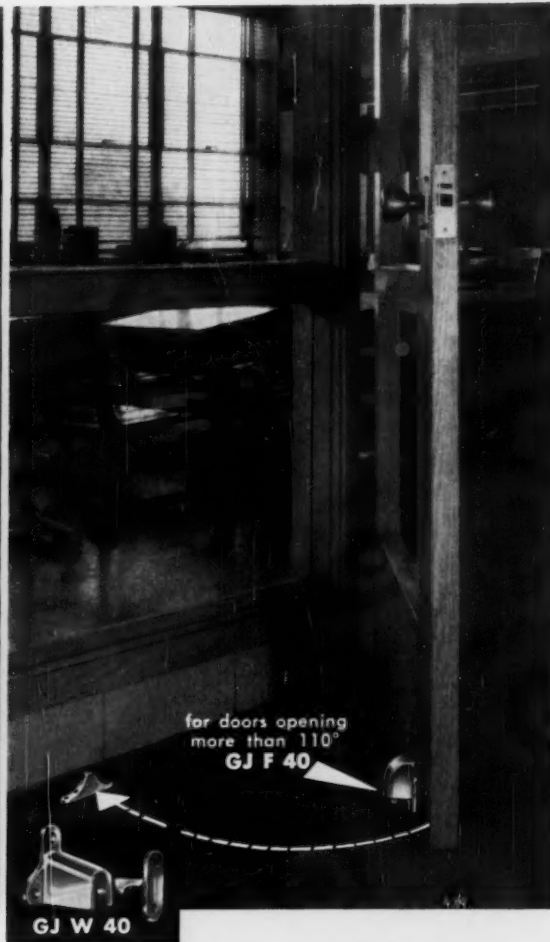
WRITE FOR
COMPLETE
DETAILS

Cramer

POSTURE CHAIR COMPANY, INC.

625 ADAMS / DEPT. TNS-2 / KANSAS CITY 5, KANSAS

2 ideal specifications for efficient CLASSROOM DOOR CONTROL



These ideal GJ specifications for classroom doors are used in such outstanding schools as:

Chicago Public Schools, Chicago, Illinois

John Muir Jr. High School, San Leandro, California. Schmidts, Hartman and Wong, Berkeley, Calif. — architects

Sinclair Lane Elem. School, Baltimore, Maryland. Edward J. Hofstetter — architect

Algonquin School, Des Plaines, Illinois. Childs and Smith, Chicago, Ill. — architects

Wellesley Senior High School Addition, Wellesley, Mass. Perry Shaw Hepburn & Dean, Boston, Mass. — architects

Also GJ shock absorbing door holders for entrance and other heavy duty doors.

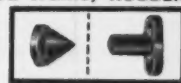


"shall have GLYNN·JOHNSON . . .

GJ 500 series CONCEALED (or surface mounted) OVERHEAD DOOR HOLDERS." (Most efficient shock absorbing device for holding door open at any specified degree up to 110°. Resilient spring cushion absorbs force of violent openings. Holds door conveniently open for continuous "through" traffic. Overhead, they present no stumbling hazard, are tamper-proof and cannot interfere with cleaning.)

"GJ F 40 FLOOR TYPE (or GJ W 40 wall mounted) COMBINATION DOOR STOP AND HOLDER." (This simple, foolproof device engages silently and automatically to hold door open. Releases with a firm pull. Rounded surfaces prevent children from "riding" bumper or damaging floor plate. Especially recommended for doors opening more than 110°.)

"THREE GJ 64 for metal frame (or GJ 65 for wood frame) RUBBER SILENCERS." (Form pneumatic air pockets to absorb shock or noise of closing and create constant latch tension . . . no door rattling.)



write for SCHOOL DOOR CONTROL brochure B-9/GI

GLYNN·JOHNSON CORPORATION

4422 n. ravenwood ave.

chicago 40, illinois

Magic Fold Tablet Arm for Folding Chairs



An addition to the BeLaire line of folding chairs is offered in the Magic Fold Tablet Arm Chair. The folding tablet arm

converts in one single-action fold with the tablet arm in the up position or folded away at a flick of the hand. The new chair is available in a choice of 25 steel, plywood or upholstered seat styles and duran, nylon or mohair upholstery. There is also a choice of seven baked enamel frame colors, or chrome or gold-bronzed plating. The chair has the non-tip safety design. The BeLa Div., J & J Tool & Machine Co., 9505 S. Prairie Ave., Chicago 28.

For more details circle #901 on mailing card.

Microtomic Lead Holder Designed for Drafting Students

The new Microtomic Lead Holder No. 605 is especially designed for drafting students and features lightweight balance,

sure grip clutch and a knurled finger grip. Colored buttons provide lead thickness identification. Two Microtomic No. 6100-2 drawing leads for use in the mechanical holder are packaged in a plastic tube and available in eight degrees. Eberhard Faber Pencil Co., Crestwood, Wilkes-Barre, Pa.

For more details circle #902 on mailing card.

Portable Paging Unit Transistorized For Indoor and Outdoor Use

The "Transi-Page," a new transistorized portable paging unit for both indoor and outdoor use, is equipped with a combination adjustable power output and volume



control which restricts distortion. The circuit design permits extremely minute drain on batteries, provides greater compactness and service-free operation. Included with the unit are a heavy-duty plug-in microphone, six-foot cord, eight-inch speaker, carrying handle and shoulder strap, as well as a 25-foot extension cord and connector for athletic field, playground or other outdoor use. Raven Electronics Mfg. Co., 2130 W. Carroll, Chicago 12.

For more details circle #903 on mailing card.



Maine Township High School, serving the Chicago suburb of Park Ridge, Illinois.



Here is the Conn Organ that won the tone contest at Maine Township High School.

Only Conn Passed the "Listening Test" At Maine Township High School!

When a school needs an organ for their auditorium, how do they go about choosing the *right* one? Here's what an active music parents group did at Maine Township High School, which serves the Chicago suburb of Park Ridge.

After raising the necessary funds, this enterprising group decided to hold a "Listening Test" to determine which make of organ would best serve their needs.

A Conn Organ was chosen to compete with three other makes of organs in a side-by-side comparison test. When all the votes were in and

tallied, the results showed Conn Organ to be superior. That's why Maine Township High School decided on a Conn for their extensive musical program.

There is a Conn Organ to meet every requirement. If you are considering the purchase of an organ for your school, talk to your Conn Organ dealer about it. He will be glad to discuss your particular requirements. And he can arrange monthly payments that are surprisingly low.

If you prefer to write for more information, here is our address: Conn Organ Corp., Elkhart, Indiana.

Portable Collator for Manual Operation

Up to 6000 pages can be assembled per hour with the new Heinz Portable Collator. Developed for use where large mechanical equipment is not required, the new colla-



tor is inexpensive and incorporates a new principle in manual paper gathering technique. Simple, fast two-handed operation which is not tiring permits fast collation of up to 12 sheets. Speed comparable to mechanical collation can be achieved even by unskilled operators. Each of the 12 stations holds 300 sheets of 20-pound paper in sizes up to 17 by 11 inches. The compact, lightweight aluminum collator requires only one and one-half square feet of desk space and weighs seven pounds.

A. P. Heinz Co., 2422 Lunt, Chicago 45.

For more details circle #904 on mailing card.

(Continued on page 218)

There is a noticeable difference in a **CONN ORGAN**



HOW TO
PROVIDE ENOUGH
ICE
FOR 3,000
THIRSTY
STUDENTS...

➤ **NORTHEASTERN UNIVERSITY'S** new \$1,500,000 Graduate Center serves more than 3,000 graduate students in the Boston area. The new building includes only the most modern equipment.

A **MODERN SCOTSMAN ICE MACHINE** solves the ice supply problem. Here, Richard Prendible, assistant cafeteria manager, scoops up pure and perfect Super Flakes from the handy bin. ➤

USE A HIGH-PRODUCTION **SCOTSMAN ICE MACHINE!**

● The 3,000 students at Northeastern University's magnificent new Graduate Center in Boston never worry about having enough ice for refreshing cold drinks... not with a modern **SCOTSMAN Super Flaker** on the job in the cafeteria!

The convenient automatic ice maker serves up a constant supply of perfect flaked ice to meet many food and beverage needs. Using ice for attractive display of salads, cold plates, butter and chilled desserts, for example, increases selection of such items and keeps them freshly appetizing as well.

Cuts ice bills 90%. Best of all is the amazing low cost of the ice produced... **SCOTSMAN Super Flakers** make a full hundred pounds for as little as 8 pennies! This represents a big money saving of up to 90% under the cost of having ice delivered!

SCOTSMAN Super Flakers keep themselves full of hospital-pure ice automatically. A flick of the switch starts a continuing flow of ice into the self-contained, stainless-steel storage bin. When the bin is full, a

thermostat automatically shuts the machine off; as ice is removed below the thermostat level, the machine turns itself on automatically to fill the bin.

A model for any need. Whether your students number 300, 3,000 or 30,000, there are **SCOTSMAN Ice Machines** that are just right for you.

You can select a **Super Flaker** from among 24 different models, producing from 100 to 4,000 pounds per day. For moderate ice requirements, select a **SCOTSMAN** with a built-in ice bin. For large volume needs, choose a continuous-flow model with a companion **Super Bin**.

Or, if you prefer to use the cubed type of ice, choose from among eight **SCOTSMAN Super Cubers** that make from 50 to 500 pounds of big and solid, long-lasting ice cubes per day.

SCOTSMAN Ice Machines are easy to install, require only routine minimum cleaning, are as dependable as a standard home refrigerator. Wouldn't your school or college like to get the facts on **SCOTSMAN**?



SCOTSMAN

Modernize with Modern Ice!

ICE MACHINES



YES! Please send complete details, including new "Ideas on Ice" booklet on Scotsman Ice Machines.



NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

MAIL TO: **SCOTSMAN ICE MACHINES**
Queen Products Division, King-Seeley Corporation
362 Front Street, Albert Lea, Minnesota
EXPORT OFFICE: 56 Beaver, New York, N.Y.



For unmatched luxury and beauty in display and parade flags, your most economical investment is a Dettra flag. Their superior quality of materials and workmanship, their long-lasting strength and enduring beauty give you far more for your budget dollar. Exclusive with Dettra:

INDOOR DURA-LITE NYLON—the ultimate in durability. Unaffected by rain. Brilliant colors.

GLORY GLOSS TAFFETA—medium weight. Wide range of rich, fade-proof colors.

ROYAL OAKS RAYON—superb, heavy, opaque "Cordura."

Also—school flags and banners made to order. Complete line of flag accessories for school bands, stadiums, special occasions. For FREE SAMPLES, literature, prices, and name of nearest Dettra Dealer, write Dept. N.

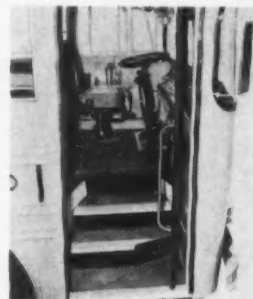


DETTA FLAG CO., INC.
Oaks, Pennsylvania

Pusher Bus Chassis

Features Easy Handling

Exceptional weight distribution with shorter wheelbase of the forward control



on the new Reo pusher, transit bus chassis expressly designed for school bus use permits turning sharp corners and easier handling. Designated the C-378, C-478 and C-578, the chassis incorporate a wide range of features to fill every need. They are engineered for perfect balance and convenience. Placement of the front axle permits the door to be located ahead of the front wheel for better driver control of entrance and exit. Other features ensure maximum maneuverability and safety. The White Motor Co., Lansing 20, Mich.

For more details circle #905 on mailing card.

Sliding Chalkboard Operator in Three Models

Three models of the device developed specifically for automatic operation of sliding chalkboards are now available. It is designed for the raising and lowering or drawing of sliding chalkboards and is available in Model 943, ¼ h.p.; Model 1463, 1/3 h.p., and Model 2913, ½ h.p. Automatic Devices Co., Allentown, Pa.

For more details circle #906 on mailing card.

Matched Dining Service in Sutherland Paper

Plates, bowls, plastic-coated hot cups, and service dishes in several shapes and



sizes are included in the complete Matched Design Dining Service introduced by Sutherland Paper Company. Developed for institutional use to save breakage and dishwashing, the line has an attractive blue dot pattern. Plates and cups are coated to retard or prevent moisture and grease penetration and protect flavor. Cups have an improved lip-rim and handled cups are available for hot beverages. The dining service reduces noise and tray weight while ensuring sanitation. Sutherland Paper Co., 243 E. Paterson St., Kalamazoo, Mich.

For more details circle #907 on mailing card.

(Continued on page 220)

world's champion weight lifter breaks record standing on the world's strongest all-steel folding chair



Paul Anderson,
U.S. Olympic
Heavyweight Champion

Electrically welded tubular steel construction...cross braces fore and aft...extra brace under the seat front: it all adds up to the strongest, "money-savingest" folding chair in the world! All metal is Bonderized to resist rust and further assure years of carefree, good-looking service. In addition, Samsonite Folding Chairs have these built-in extras: COMFORT...contour seats and back rests "cradle" the sitter for greater comfort over longer periods of time; EASE OF HANDLING...Samsonite's legs glide open and closed, safety hinges can't pinch fingers; STYLE...11 new colors—all finished in smart-looking baked enamel that won't snag or chip.

now at a new low price

For church, school, club, or group seating information, see your Yellow Pages or write: Shwayder Bros., Institutional Seating Div., Dept. NS-20, Detroit, Mich.



Samsonite

folding chairs last longest

©1960

All-Purpose Steel Folding Chair in Adjusteze Model 1601



Model 1601 Adjusteze tubular folding chair is an all-purpose unit for all school needs. Unusually sturdy in construction,

the chair has tubular steel "Y" type legs, non-tilting safety design, formed metal back and contoured wood seat for comfort in use. It folds compactly to minimum thickness for ease in stacking and storage. Adjusteze Furniture Div., State Industries, 4019 Medford St., Los Angeles 63, Calif.

For more details circle #908 on mailing card.

50th Anniversary Planer Has Chip Breaker-Deflector

A complete guard for the cutterhead of the 50th Anniversary Model Boice-Crane 12 by four-inch planer is provided by the combined chip breaker-deflector. The flattened trajectory gives accelerated velocity, causing chips to accumulate farther back of the work zone, protecting the

finished lumber surface and reducing dust in the immediate work area. The new planer has other features for efficient operation. Boice-Crane Co., 975 W. Central Ave., Toledo 6, Ohio.

For more details circle #909 on mailing card.

Model "U" Inspect-O-Film Completely Redesigned

Years of development and research have gone into the new Model "U" Inspect-O-Film to make it an efficient and easily op-



erated unit. The new "Open line threading" feature gives a wide, unobstructed path for placing film to be inspected. Many new mechanical features increase speed in use and provide increased operator convenience. The new defect detector detects defects such as cracks, tears or missing sections in the sound track. In addition to the mechanical improvements to facilitate use, the cabinet is re-styled with a large Formica work surface, shadow-free lighting, and attractive appearance. It may be operated sitting or standing with reels located at the height proved most relaxing for the operator. The Harwald Co., 1245 Chicago Ave., Evanston, Ill.

For more details circle #910 on mailing card.

OLYMPIA HIGH SCHOOL

Architects:
Faragher &
Macomber



CRAIG HILL ELEMENTARY SCHOOL Architects: C. Storrs Barrows & Associates

LONGRIDGE SCHOOL

Architects:
Wassdorp &
Northrup



At Greece, New York

THREE MORE SCHOOLS TO HAVE BUILT-IN CLEANING ECONOMY

with SPENCER VACUSLOT® SYSTEMS

In these days when administrators and school boards are seeking means of improving sanitation and simultaneously reducing maintenance costs, the case of Greece, New York is significant.

Installed at the West Ridge school, a Spencer Vacuslot system demonstrated its efficiency and economy so effectively that similar systems have been specified into three more schools.

For routine maintenance, large dry mops are used to push dirt and litter to the Vacuslot, where powerful vacuum whisks it away through the piped system. Dry mops are then vacuum cleaned simply by passing back and forth across the Vacuslot.

The versatile system is also used for conventional vacuum cleaning, eraser cleaning, water pick-up (in conjunction with a portable wet separator) and for cleaning boiler tubes.



REQUEST BULLETIN NO. 153C

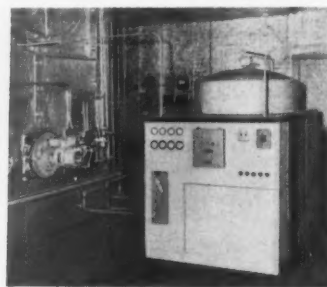
ALSO
MANUFACTURERS
OF A COMPLETE
LINE OF
PORTABLE VACUUM
CLEANERS.



The **SPENCER**
TURBINE COMPANY
HARTFORD 6, CONNECTICUT

Boiler Water Control Systems Eliminate Solids

The new Filtrion Side-Stream Automatic Boiler Water Control continuously recirculates boiler water through a side-stream filter that reduces suspended solids



to a value close to zero. The side-stream filtration is combined and integrated with chemical pretreatment, internal treatment, continuous minimum blowdown and feed-water preheating and degassing, all in one automated unit. The system keeps boiler water clear by eliminating sludge and suspended solids, resulting in savings in fuel, treatment chemicals, heat and water losses and contaminated condensate losses. Operating and maintenance costs are reduced with efficiency increased. Sparkler-Filtrion Corp., North Chicago, Ill.

For more details circle #911 on mailing card.

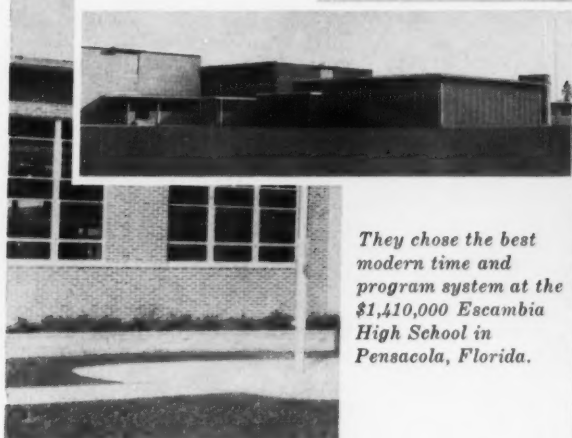
(Continued on page 222)

School Superintendent:
William J. Woodham, Jr.

Architect:
Frank J. Sindelar
Pensacola, Florida

Engineers:
James A. Evans &
James L. Phillips
Birmingham, Alabama

Electrical Contractor:
Boraco Electric Company
Pensacola, Florida



*They chose the best
modern time and
program system at the
\$1,410,000 Escambia
High School in
Pensacola, Florida.*



In Escambia High School . . .

Stromberg's new Electronic Time and Program System supervises *time* and *activities*

Dependable "on-time" schedules and smooth-flowing student traffic are assured in this modern school. This performance results from such Stromberg System features as:

- Jeweled Master Clock movement with automatically wound 72-hour spring power reserve.
- Secondary Clocks standard with hourly and 12-hour supervision—correction cycles completed in *only 60 seconds*.
- Program Unit, capable of 1440 signals daily on each circuit, immediately resets following power interruption.
- Central operations panel for control of utilities.
- Seven-channel transmitter—one for clock supervision, six for program signals.
- Installation and maintenance service available throughout U.S.A. and Canada.

A complete catalog—TIME AND SIGNAL EQUIPMENT—prepared especially for Architects and Engineers—is yours for the asking.
Sales and Service Offices throughout the U.S.A.



STROMBERG

DIVISION OF GENERAL TIME CORPORATION

MAIN STREET, THOMASTON, CONNECTICUT

A half century of experience building dependable time products.

Literature and Services

• **Catalog No. 307** covers all phases of the P. A. systems available from Bogen-Presto company, Box 500, Paramus, N.J. Presented in the 16-page book is information on the complete new "M" Series of P.A. equipment, including every component from cables to complete integrated sound systems; data on the new Series "TQ" Bogen-Phone, and data on the new Bogen lightweight BT-400 P.A. amplifier.

For more details circle #912 on mailing card.

• Complete information on the full line of **Berlin Bleachers** is available in a new 16-page illustrated catalog offered by the Bleacher Division of Berlin Chapman Co., Berlin, Wis. Included are EZ-A-Way Me-

chanical Folding Bleachers and folding chair stands, electrically operated folding bleachers, folding wall seats, portable bleachers, steel deck, standard permanent and deluxe permanent grandstands, basketball backstops and automatic basketball and golf practice cages.

For more details circle #913 on mailing card.

• How the **Wheelit combination transportation and projection table** was rated in California schools is the subject of a leaflet available from the manufacturer, Gruber Products Co., 2223 Albion, Toledo 6, Ohio. Illustrations show how the Wheelit holds all projection material for transporting or showing audio-visual material, and folds compactly when not in use.

For more details circle #914 on mailing card.

• Those concerned with food service in schools, as well as in other public institutions and in the home, will find much helpful information in the 450-page compendium on nutrition offered by H. J. Heinz Co., P.O. Box 57, Pittsburgh 30, Pa. Written by the Heinz nutrition specialist, Dr. Benjamin Burton, with the assistance of an editorial board of six nutrition authorities, the **"Heinz Handbook of Nutrition"** is the first book-length scientific work to come out of the year-old Heinz Research Center.

For more details circle #915 on mailing card.

• **"Specialty Classroom Units by Royal"** is the title of a colorful folder illustrating and describing typing, art and bookkeeping desks, special student chairs and cabinets and stools available from Royal Metal Mfg. Co., One Park Ave., New York 16.

For more details circle #916 on mailing card.

• Detailed descriptions and illustrations of "Engineered Economy" fixtures designed for school lighting are featured in the **"School Lighting Folder"** available from Smithcraft Lighting, Chelsea 50, Mass. Especially mentioned is the Federal fixture, a new addition to the Smithcraft line.

For more details circle #917 on mailing card.

• **"Catalog C-3"** gives specifications, illustrations and descriptions of some of the laboratory equipment manufactured by Modern Laboratory Equipment Co., Inc., 1809 First Ave., New York 28. Included are convection and hazardous atmosphere ovens, dry air sterilizers, incubators and temperature controls.

For more details circle #918 on mailing card.

• Thirty-two pages of helpful, illustrated hints for students and instructors are included in the new booklet, **"Tips-Techniques and Drafting Aids"** available from Alvin & Co., Inc., 611 Palisado Ave., Windsor, Conn. The booklet, selling at 50 cents per copy, is divided into classifications for greater usefulness.

For more details circle #919 on mailing card.

• All students in junior and senior high schools in the United States and its territories are eligible to enter the **1960 Scholastic-Ansco Photography Awards competition**. Divided into three divisions with 15 classifications, the competition carries cash prizes for each classification, given by Ansco, Binghamton, N.Y., and by Sylvania Electric Products, Inc. Rules booklets for the competition are available from Ansco dealers or Scholastic-Ansco Photography Awards, 33 W. 42nd St., New York 36.

For more details circle #920 on mailing card.

• Two new home economics brochures about canned foods are now available from the National Canners Assn., 1133 20th St. N.W., Washington 6, D.C. **"Let's Explore Canned Foods"** is the title of a leaflet planned to fit junior high school foods classes. For senior high school teaching an eight-page brochure entitled **"Know Your Canned Foods"** is also suitable for college and adult groups. Other helpful teaching material includes **"How the Descriptive Label Helps the Canned Foods Shopper"** and a leaflet, **"Of Recipes . . . and can sizes."**

For more details circle #921 on mailing card.

(Continued on page 224)

The KEYSTONE Standard Overhead Projector

is available for purchase under the

National Defense Education Act



The Keystone Standard Overhead Projector is designed for the projection of Standard (3 1/4" x 4") Lantern Slides, Polaroid Slides, and Handmade Lantern Slides or, with appropriate accessories Tachistoslides (4" x 7"), 2" or 2 1/4" Slides, Strip Film, and Microscopic Slides.

It is useful—

In the Science Category with appropriate units of slides in Physics, Biology, General Science, Health, Physiography, and Elementary Science.

In the Mathematics Category in teaching Number-Combinations and Fraction-Combinations tachistoscopically; Solid Geometry with Stereograms.

In the Modern Languages Category in teaching French, Spanish, German and Russian with Tachistoscopic Units.

Write for Further Information or a Demonstration by our Local Representative.

KEYSTONE VIEW CO., Meadville, Pa.

Since 1892, Producers of Superior Visual Aids

Lather • Fragrance • Safety

Premium antiseptic liquid soap

Balmaseptic

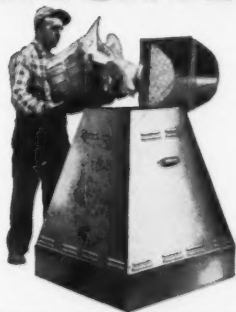
For washroom and shower.
Contains Hexachlorophene

Clear, brilliant Balmaseptic rubs up quickly into handfuls of fragrant lather. Cleanses energetically, yet does not irritate the skin — does not chap. Regular use keeps the hands surgically clean: *the HEXachlorophene puts the HEX on bacteria.* Balmaseptic dispenses neatly — stores perfectly: does not turn cloudy or rancid, regardless of climate. Exceeds forthcoming U.S.P. Specifications for Hexachlorophene liquid soap

For free sanitary survey
of your premises ask
your Dolge service man

Dependable
DOLGE
WESTPORT, CONNECTICUT

LOW COST INCINERATOR



**BURNS
TRASH
SAFELY
OUTDOORS**

**Only \$110.00
COMPLETE**

NO INSTALLATION COST

Burn wrappings, sweepings, papers, cartons, packing, rags, food waste, safely outdoors. Scientific draft control ends fire hazards of flying ash, sparks, burning blowing papers. Burns damp, green, or dry refuse to fine ash in any weather. Minimizes smoke and smell, needs no watching. Safe for use 10' from buildings. Stands 52" high x 35" square at base. 10 bushel burning capacity. Complete with hinged hood, ash pan base and grate and cleanout door. Made of aluminumized steel (molten aluminum bonded to steel) with replaceable inner steel panel construction for long life. Shipped assembled—weight 170 lbs. Only \$110.00 F.O.B. Cleveland. Satisfaction guaranteed. Other sizes available.

Write
for
FREE
Folder

ALSTO COMPANY

Dept. 27 4007 Detroit Ave. Cleveland 13, Ohio

since 1830 makers of furniture for public use

THONET

write for illustrated material. **THONET INDUSTRIES INC.**

One Park Avenue, New York 16, N. Y.

SHOWROOMS: New York, Chicago, Detroit, Los Angeles,
San Francisco, Dallas, Miami, Statesville, N. C.



design 3221

UNEXCELLED VALUE AND CRAFTSMANSHIP

... a Desks of America Tradition

*The Complete Line of Fine Classroom Furniture
Superbly styled—and sturdy • Efficient—and flexible
Used by schools throughout the nation*

BUSINESS EDUCATION FURNITURE

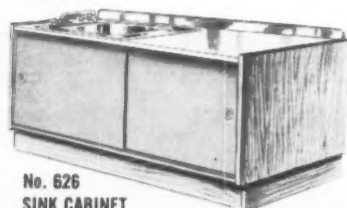


Full selection of adjustable typing desks; drophead, modular, electric desks; bookkeeping tables; posture seating.

Shown: No. 110 Modular Typing Desk; No. 48 3-way adjustable chair.

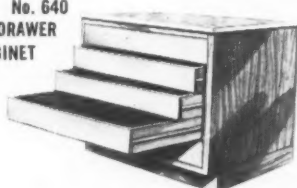
CLASSROOM CABINETS

Versatile, flexible and economical, both our Standard and Contemporary lines offer a wide choice of classroom cabinets, bookshelving, and teachers' cabinets for every room in your school.



No. 626
SINK CABINET

No. 640
PAPER DRAWER
CABINET



Another Desks of America first! Now perfected—revolutionary mar-proof plastic finish for all our cabinets and classroom furniture. Even more help to eliminate maintenance costs.

CLASSROOM DESKS AND CHAIRS



No. 9-TA
TABLET
ARM CHAIR



No. 5312
OPEN
BOX TABLE DESK



No. 5121
CHAIR

These famous "Kenney" desks, tables and chairs have been manufactured in our New England plant for over two generations. Each item is constructed of northern birch kiln-dried at our own plant.

A cordial invitation: Visit us at the AASA convention in Atlantic City, February 13-17. Our exhibit will be on the main floor, booth L6-7-8.

DESKS OF AMERICA Inc.
Bridgeport 6, Connecticut

FREE catalogs
sent to
you on
request.

• Two new books for science instructors and administrators are available from Central Scientific Co., 1700 Irving Park Rd., Chicago 13. A new 32-page booklet on elementary science apparatus contains information on hundreds of items for science instruction and is designed to assist in the selection of apparatus and materials needed to initiate or supplement elementary science courses. The second is a new 144-page order book which contains suggested science apparatus for the enrichment of elementary and secondary science courses as outlined under Title III, National Defense Education Act, and covers 2000 items for teaching chemistry, biology and physics as well as those for teaching atomic science, earth science, electronics and meteorology.

For more details circle #922 on mailing card.

• "RCA Electronic Aids to Education" are the subject of an eight-page catalog released by Radio Corporation of America, Educational Services Dept. 59, Camden 2, N.J. Descriptive information and illustrations cover radio, records, TV, electron microscopes, tubes, high fidelity components, intercom systems, language laboratories, and other electronic equipment.

For more details circle #923 on mailing card.

• Bulletin F 50100 on the Chromalox Electric Baseboard Heaters, type BBC, discusses the design and operation of this rugged baseboard heater and its accessory parts designed to provide true perimeter heating comfort in classrooms and other areas of schools and other institutions. It is available from Edwin L. Wiegand, 7500 Thomas Blvd., Pittsburgh 8, Pa.

For more details circle #924 on mailing card.

• "Surface and Pendant Fluorescent Lighting By Lightolier" is illustrated and described in a 24-page catalog available from Lightolier Inc., 346 Claremont Ave., Jersey City, N.J. Three new lighting units are introduced and full specifications, including E.T.L. reports, lighting calculator charts and detailed drawings are given.

For more details circle #925 on mailing card.

• "115 Ways A Photocopy Machine Can Save You Money," published by F. G. Ludwig, Inc., 163 Coulter Place, Old Saybrook, Conn., gives a brief description of each of the hundreds of ways photocopy machines can be used. Two photocopy machines manufactured by F. G. Ludwig are illustrated and described.

For more details circle #926 on mailing card.

• Association Films, Inc., 347 Madison Ave., New York 17 lists over 500 free and rental 16mm motion pictures in its 44-page catalog, "Selected Motion Pictures." Included are comedies, educational films, feature movies and Walt Disney films.

For more details circle #927 on mailing card.

• "Vibration of Molecules" and "An Introduction to Reaction Kinetics" are the titles of two new films intended as teaching aids for courses in general and physical chemistry. They were produced by Sutherland Educational Films, Inc., 201 N. Occidental Blvd., Los Angeles 26, Calif., under the supervision of a committee from the American Chemical Society.

For more details circle #928 on mailing card.

• The complete line of portable science tables manufactured by Laboratory Furniture Co., Inc., Old Country Rd., Mineola, L.I., N.Y. is described and illustrated in **Bulletin P10** released by the manufacturer. Included are the fully equipped "Instructolab" science center, demonstration fume hood, apparatus tables and carts.

For more details circle #929 on mailing card.

• A **Quality Evaluation Guide** for light control draperies is available from Plastic Products Inc., 1822 E. Franklin St., Richmond 23, Va. Information on materials, design, construction and diversification is presented to help the purchaser in evaluating products available.

For more details circle #930 on mailing card.

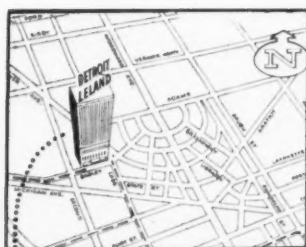
• A comprehensive and detailed guide to modern and efficient technics of building maintenance is available from S. C. Johnson & Son, Inc., Racine, Wis. The 27-page "**Building Maintenance Manual**" is divided into 12 sections which describe the most recent developments in methods, materials and products.

For more details circle #931 on mailing card.

• "New Sanymetal Integral Hinge Brackets" are described and pictured in a new eight-page booklet available from Sanymetal Products Co., Inc., 1696 Urbana Rd., Cleveland 12, Ohio. Pictorial and documentary evidence of the strength and long life of these hinge brackets for toilet compartment doors is given.

For more details circle #932 on mailing card.

(Continued on page 226)



center of importance
in **DETROIT**

- 800 fine rooms with bath, radio, TV
- Grenadier Dining Room and Lounge
- Coffee Shop
- Convention Facilities
- Ample Parking

Lanson M. Boyer,
Gen. Mgr.

DETROIT
LELAND ^{AAA}
HOTEL
CASS AVE. AT BAGLEY
DOWNTOWN DETROIT 26, MICHIGAN



*surface stains can be removed without
harming or changing the surface*

ALBERENE STONE

—for 75 years the only permanently satisfactory material for chemical laboratory table tops, shelving, sinks, splash backs, drain boards and fume hoods. Prompt delivery.

For FREE literature and technical assistance address: ALBERENE STONE

(A DIVISION OF THE GEORGIA MARBLE COMPANY) 386 FOURTH AVE., NEW YORK 16, N. Y. DEPT. S

No. 1

**IN
AMERICA'S
SCHOOLS**

Master

COMBINATION PADLOCKS



No. 1525 — Thousands of combinations, with 3-number dialing, protect the student — yet only one school-owned master key opens every locker.

No. 1500
Same as No. 1525, but without key-control.

FREE — 4 page folder with complete information on both No. 1525 and No. 1500. Write today to Dept. 8.

KEY-CONTROLLED
School's master key opens every locker.

STAINLESS STEEL CASE

Master Lock Company, Milwaukee 45, Wis.
World's Largest Padlock Manufacturers

Film Releases

"Designing a Better Tomorrow," 16mm 13½ min. vocational guidance film to interest students in architecture as a profession, semi-animated, sound and color. The American Institute of Architects, 1735 New York Ave., N.W., Washington 6, D.C.

For more details circle #933 on mailing card.

New series of eight 29-minute 16mm films for high school, college and adult education classes, on "The Months Before Birth," including "The Physiology of Reproduction," "The Beginnings of Pregnancy," "The First Visit to the Doctor," "Nutrition and Dental Care in Pregnancy," "The Middle Months of Pregnancy," "The Last Months of Pregnancy," "The Birth of the

Baby," and "The Weeks After Birth." Dr. Anne B. Wagner, chief of Maternal and Child Health Division, Pittsburgh Department of Health, uses discussions, charts, still photographs and film clips to tell the story. Audio-Visual Center, Indiana University, Bloomington, Ind.

For more details circle #934 on mailing card.

"Founders of America" and "Leaders of America," each series of six black and white filmstrips, and "Builders of America," series of eight, all on outstanding Americans. "Adventures of a Chipmunk Family," 11 min.; "The Arctic Islands of the Frozen Sea," 30 min.; "Hawaii—The Fiftieth State," 17 min.; "What Plants Need for Growth," 10 min.; "Drive Defensively," 11 min. driver education film; "Health in

Our Community," 13 min.; "Peru: People of the Andes," 16 min.; "China Under Communism," 22 min., and "Safety Adventures Out of Doors," 11 min., all 16mm sound films in black and white or color. Encyclopaedia Britannica Films, 1150 Wilmette Ave., Wilmette, Ill.

For more details circle #935 on mailing card.

Four "Beginning Spanish" films, emphasizing hearing and speaking the language: "A Problem of Algebra," "A Treasure Hidden," "The Meeting," and "Although One Dresses in Silk," with live action and animation, entirely in Spanish, with accompanying filmstrip and tape for teaching. Pacific Productions, Inc., 414 Mason, San Francisco 2, Calif.

For more details circle #936 on mailing card.

"Life Long Ago," the Earth Science Series, set of six filmstrips in full color, grades five through nine, and "Our Ever-Changing Earth," Earth Science or Physical Geography, set of six filmstrips in full color for grades six through nine. Society for Visual Education, Inc., 1345 W. Diversey Pkwy., Chicago 14.

For more details circle #937 on mailing card.

Suppliers' News

Dudley Lock Corporation, manufacturer of locks for school equipment, announces its move from Crystal Lake, Illinois, to a new air-conditioned plant at 1436 Old Dixie Highway, Vero Beach, Florida. The new plant and new machinery are planned to meet the growing business of the company and to give the field the best service with economy.

Food Machinery & Chemical Corp., San Jose, Calif., manufacturer of food service machinery and equipment, announces acquisition of all manufacturing and sales rights to the Kingston Disintegrator, a five h.p. food waste disposer for institutional use, from Kingston Products Co., Kokomo, Ind. The Disintegrator will be manufactured in the Hoopeston, Ill. plant of Food Machinery & Chemical Corp. and will be marketed through its Kitchen Equipment Dept.

Kewaunee Scientific Equipment is the name of a new division formed by Kewaunee Mfg. Co., Adrian, Mich., to meet the increasing requirements for highly specialized equipment. The new division is manned by a separate group of experienced engineers responsible for the design and construction of highly technical equipment and apparatus for research and production.

Waco-Porter Corporation is the new corporate name of the former Waco Manufacturing Co. of Minneapolis. The name was changed because of the acquisition in 1957 of the Porter Athletic Equipment Division, formerly a part of the J. E. Porter Corp. of Ottawa, Ill., which in November was moved into a new plant in Schiller Park, Ill., for the increased production of basketball backstops, gymnasium and playground equipment. Waco-Porter also announces purchase of Bemis Brothers Bag Company's Transwall Division, manufacturer of folding partitions for schools and other institutions.



NATURAL SLATE CHALKBOARDS

... because young eyes deserve the best!

The Alexander Ramsey Junior-Senior High School was a special awards winner in the 1954 "School Executive" competition. Thus, it comes as no surprise that the specifications for this forward-looking school included natural domestic slate chalkboards. For of all chalkboards, slate communicates best. Only white chalk on slate produces the desired high contrast necessary to permit young eyes to see and grasp the written message instantly. Only slate is so easy to clean . . . so durable . . . so low in annual maintenance cost . . . and so harmonious with traditional or contemporary decor. That's why leading schools, like Alexander Ramsey, continue to specify natural slate . . . quarried in Pennsylvania.

for information on specific properties of slate, write:

NATURAL SLATE CHALKBOARD CO.

THE STRUCTURAL SLATE CO. Pen Argyl, Pa.

Members—Pennsylvania Slate Producers Guild

natural slate . . . 500 million years in the making



INDEX TO ADVERTISEMENTS

USE THIS PAGE TO REQUEST PRODUCT INFORMATION

The index on this and the following page lists advertisements in this magazine alphabetically by manufacturer. For additional information about any product or service advertised, circle the manufacturer's key number on the detachable postcard and mail it. No postage is required.

Products described in the "What's New" pages of this magazine also have key numbers which appear in each instance following the description of the item. For more information about these items, circle the appropriate numbers on the postcard and mail it, without postage, to The Nation's Schools.

Key	Page	Key	Page	Key	Page
1 Acme Chemical Company	198	25 Brodhead-Garrett Company	5	49 Delco Company, C. B.	223
2 Acme Visible Records, Inc.	130	26 Brown Company, M. D.	206	50 Dudley Lock Corporation	136
3 Acorn Wire & Iron Works	174	27 Buck Engineering Company, Inc.	200	51 Du Pont de Nemours & Co., Inc., E. I.	161
4 Advance Floor Machine Company	146	28 Buckstaff Company	182	52 Duralab Equipment Corporation	36
5 Ajusto Equipment Company	186	29 Burgess-Manning Company	199	53 Eastman Kodak Company	119
6 Alberene Stone Corporation	225	30 Burke Company, J. E.	31	54 Electronic Instrument Co., Inc.	160
7 Alsto Company	223	31 Burroughs Corporation	157	55 Elgeet Optical Company, Inc.	46
8 American Bitumuls & Asphalt Com- pany	173	32 Central Scientific Company	183	56 Eureka Williams Corporation	206
9 American Bridge Division, U. S. Steel Corporation	22, 23	33 Cincinnati Time Recorder Company ..	28	57 Everett Piano Company	212
10 American Crayon Company	156	34 Claridge Products & Equipment Co. ..	196	58 Executone, Inc.	201
11 American Desk Mfg. Company	41-44	35 Clarin Mfg. Company	129	59 Field Enterprises, Inc.	133
12 American Optical Company	208	36 Clarke Floor Machine Company ..	134, 135	60 Fluor Products Company	57
13 American Seating Company	61, 62	37 Conn Organ Corporation	216	61 Ford Motor Company	124, 125
14 Apco Products Inc.	181	38 Continental Can Company	113	62 Gaylord Brothers, Inc.	162
15 Arlington Seating Company	Cover 4	39 Corning Glass Works	213	63 Geerpres Wringer, Inc.	176
16 Audio Equipment Company, Inc.	206	40 Cousino Electronics Corporation	172	64 General Electric Company	55
17 Bastian-Blessing Company	2	41 Cramer Posture Chair Company	214	65 Glynn-Johnson Corporation	215
18 Bausch & Lomb Optical Company ..	17-20	42 Cutler Light Mfg. Company	27	66 Gougler Keyless Lock Company, C. L.	174
19 Bay West Paper Company	194	43 Decar Plastic Corp.	Cover 3	67 Grade-Aid Corporation	154
20 Beckley-Cardy Company	185	44 Dependable Mfg. Company	183	68 Graflex, Inc.	12
21 Billerett Company	190	45 Desks of America, Inc.	224	69 Hampden Specialty Products, Inc.	21
22 Bradley Washfountain Company	152	46 Detroit-Leland Hotel	225	70 Hardwood Products Corporation	30
23 Brillo Mfg. Company	191	47 Dettra Flag Company, Inc.	218	71 Herrick Refrigerator Company	54
24 Brinkton, Inc.	197	48 Ditto, Inc.	187	72 Heywood-Wakefield Company ...	9, 11, 13
				73 Hillyard Chemical Company	163

(continued on next page)

USE THIS CARD

(We pay the postage)



I am interested in the items circled—

February, 1960

WHAT'S NEW						
834	835	836	837	838	839	
840	841	842	843	844	845	
846	847	848	849	850	851	
852	853	854	855	856	857	
858	859	860	861	862	863	
864	865	866	867	868	869	
870	871	872	873	874	875	
876	877	878	879	880	881	
882	883	884	885	886	887	
888	889	890	891	892	893	
894	895	896	897	898	899	
900	901	902	903	904	905	
906	907	908	909	910	911	
912	913	914	915	916	917	
918	919	920	921	922	923	
924	925	926	927	928	929	
930	931	932	933	934	935	
936	937					

ADVERTISEMENTS													
1	2	3	4	5	6	7	8	9	10	11	12	13	14
15	16	17	18	19	20	21	22	23	24	25	26	27	28
29	30	31	32	33	34	35	36	37	38	39	40	41	42
43	44	45	46	47	48	49	50	51	52	53	54	55	56
57	58	59	60	61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80	81	82	83	84
85	86	87	88	89	90	91	92	93	94	95	96	97	98
99	100	101	102	103	104	105	106	107	108	109	110	111	112
113	114	115	116	117	118	119	120	121	122	123	124	125	126
127	128	129	130	131	132	133	134	135	136	137	138	139	140
141	142	143	144	145	146	147	148	149	150	151	152	153	154
155	156	157	158	159	160	161	162	163	164	165	166	167	168
169	170	171	172	173	174	175							

NAME

TITLE

INSTITUTION

ADDRESS

ZONE

STATE

INDEX TO ADVERTISEMENTS

(continued from preceding page)

Key	Page	Key	Page	Key	Page
74 Hobart Mfg. Company	142, 143	109 Minneapolis-Honeywell Regulator Co.	138, 139	144 Royal McBee Corporation	169
75 Holcomb & Hoke Manufacturing Com- pany, Inc.	175	110 Minnesota Mining & Mfg. Company ..	132	145 Royal Manufacturing Company, Inc.	159
76 Hunt Pen Company, C. Howard	7	111 Mitchell Mfg. Company	189	146 St. Charles Mfg. Company	51
77 Hunter Douglas Aluminum Corpora- tion	211	112 Monroe Company	175	97 Sanitary Scale Company	145
78 Huntington Laboratories	35	113 Montgomery Mfg. Company	175	147 Scotsman-Queen Products, Inc.	217
79 Huntington Laboratories	37	114 Mott Corporation	197	148 Sheldon Equipment Company, E. H.	126, 127
80 Irwin Seating Company	58	115 Multi-Clean Products, Inc.	209	149 Sheldon Machine Co., Inc.	184
81 Jennison-Wright Corporation	158	116 Natco Corporation	111	150 Shwyder Brothers, Inc.	219
82 Johnson & Son, Inc., S. C.	33	117 National Cash Register Company	155	151 Sico Manufacturing Company, Inc. 52, 53	
83 Kalwall Corporation	25	118 National Gypsum Company	193	152 Simoniz Company	45
84 Kewaunee Mfg. Company	123	119 National Lock Company	131	153 Singer Sewing Machine Company	38
85 Keystone View Company	222	120 National Lumber Manufacturers Assn.	148, 149	154 Sloan Valve Company	1
86 Kinnear Manufacturing Company	204	121 National School Furniture Company ..	16	155 Southern Equipment Company	60
87 Kohler Company	40	122 National Sporting Goods Association ..	26	156 Spencer Industries	207
88 Laboratory Furniture Company, Inc.	190	123 National Super Service Company	180	157 Spencer Turbine Company	220
89 Lehn & Fink Products Corporation ...	182	124 National System of Garage Ventila- tion	192	158 Stacor Equipment Company	164
90 Levolor-Lorentzen, Inc.	153	125 Neubauer Mfg. Company	34	159 Standard Electric Time Company 14, 15	
91 Libbey-Owens-Ford Glass Company 205		126 New Castle Products, Inc.	Cover 2	160 Stromberg Time Corporation	221
92 Lily-Tulip Cup Corporation	49	127 Nissen Trampoline Company	195	161 Strong Electric Corporation	192
93 Locke Steel Chain Company	166	128 Norton Door Closer Company	151	162 Structural Slate Company	226
94 Logan Engineering Company	140	129 Nystrom & Company, A. J.	203	163 T & S Brass & Bronze Works, Inc.	207
95 Luminous Equipment Company	160	130 Ohaus Scale Corporation	150	164 Testa Mfg. Co.	179
96 Lyon Metal Products, Inc.	156	131 Olson Mfg. Company, Inc., Samuel ..	197	165 Thomas Collators Inc.	168
97 M. J. M. Manufacturing Company	145	132 Owens Illinois: Kimble Glass Com- pany Subsidiary	47	166 Thompson Electric Company	10
98 Magnetic Recording Industries	117	133 Palmer Company, A. N.	202	167 Thonet Industries, Inc.	223
99 Maico Company, Inc.	56	134 Pennsylvania Slate Producers Guild Inc.	188	97 Triumph Manufacturing Company	145
100 Maple Flooring Mfrs. Assn.	167	135 Peterson Company, D. J.	196	168 Tucker Manufacturing Company	183
101 Market Forge Company	182	136 Peterson & Company, Leonard	177	97 United Manufacturers	145
102 Marsh Wall Products, Inc.	59	137 Philco Corporation	165	9 United States Steel Corporation - 22, 23	
103 Master Lock Company	225	138 Plastic Products, Inc.	178	97 Universal Dishwashing Machinery Company	145
104 Masury-Young Company	50	139 Radio Corporation of America ...	170, 171	169 Vendo Corporation	29
105 Medart Products, Inc., Fred	137	140 Rauland-Borg Corporation	174	170 Victor Animatograph Corporation	192
106 Meierjohan-Wengler	156	141 Recreation Equipment Corporation ...	210	171 Viewlex, Inc.	39
107 Metropolitan Wire Goods Corpora- tion	144	142 Rockwell Mfg. Company	147	172 Wayne Iron Works	128
108 Metwood Manufacturing Company	207	143 Royal McBee Corporation	112	173 Wear-Ever Aluminum, Inc.	141
				174 Weber Costello Company	210
				175 Wells Lumber Company, J. W.	210

FIRST CLASS
PERMIT NO. 136
CHICAGO, ILL.

BUSINESS REPLY MAIL

No Postage Stamp Necessary If Mailed in the United States

POSTAGE WILL BE PAID BY

THE NATION'S SCHOOLS

919 NORTH MICHIGAN AVENUE

CHICAGO 11, ILLINOIS

DECARLITE TOPS

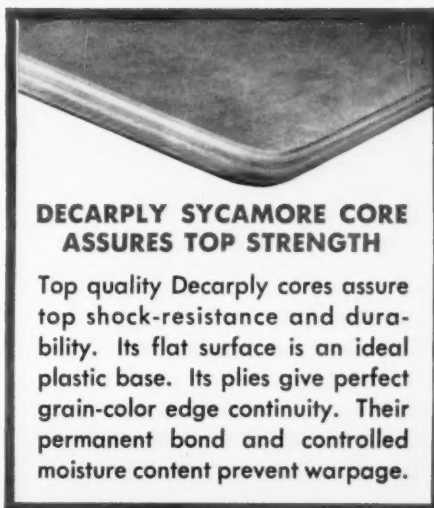


NEW *Brunswick* CONTEMPORARY SERIES

Brunswick research and development designs school furniture to meet the *actual needs* of contemporary education. In working out the new parchment pattern plastic tops featured on this Brunswick Contemporary Series, Decar was selected to develop them. Decarlite tops this advanced furniture to assure it meets your every need for beauty, function and maintenance-free durability. More and more manufacturers, and schools, too, are finding Decarlite first choice for top performance.

New Ophtho-Light work surfaces on Brunswick's new Contemporary Series are kind to eyes—minimize reflection and glare. Made with Decarlite, they meet or exceed N.E.M.A. Standards.

Ask Your Furniture Supplier About Decarlite Tops!



DECARPLY SYCAMORE CORE ASSURES TOP STRENGTH

Top quality Decarply cores assure top shock-resistance and durability. Its flat surface is an ideal plastic base. Its plies give perfect grain-color edge continuity. Their permanent bond and controlled moisture content prevent warpage.



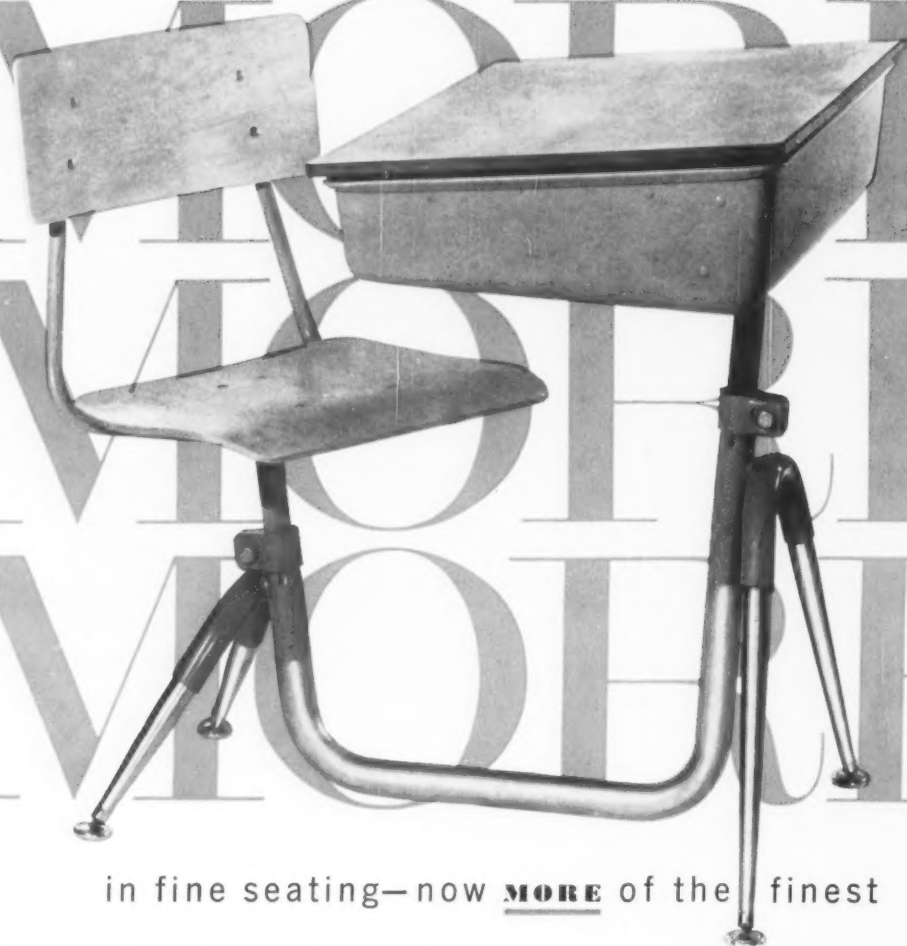
PLASTIC CORPORATION

1212 NORTH CENTRAL PARK AVENUE, CHICAGO 51, ILLINOIS

Manufacturing: 1322 University Avenue, Middleton, Wisconsin

ARLINGTON

Polaris



in fine seating—now **MORE** of the finest



SEATS AND BACKS—in choice of maple veneered hardwood plywood or the new soft, flexible Arlex plastic.



DESK TOPS—all of durable plastic.



METAL FINISHES on book box and frame in choice of five modern colors.



LEGS AND CROSS BAR in scuff resistant long wearing chrome finish.

However you judge good seating, you'll find the Arlington Polaris gives more. More compactness. More ease in grouping. More selection of metal colors. More choice in seat and desk top materials. More flexibility in obtaining the combination you want. Lid can be used in inclined or level position. The seat conveniently swivels. We cordially invite you to see the Polaris.

ARLINGTON SEATING COMPANY • ARLINGTON HEIGHTS, ILLINOIS

Arlington a complete choice of
school seating models and sizes for every classroom need

for complete information write for Catalog 60

